IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication SEPTEMBER 29, 1960

George Kufrin

★ GOP Platform Chairman Charles H. Percy:

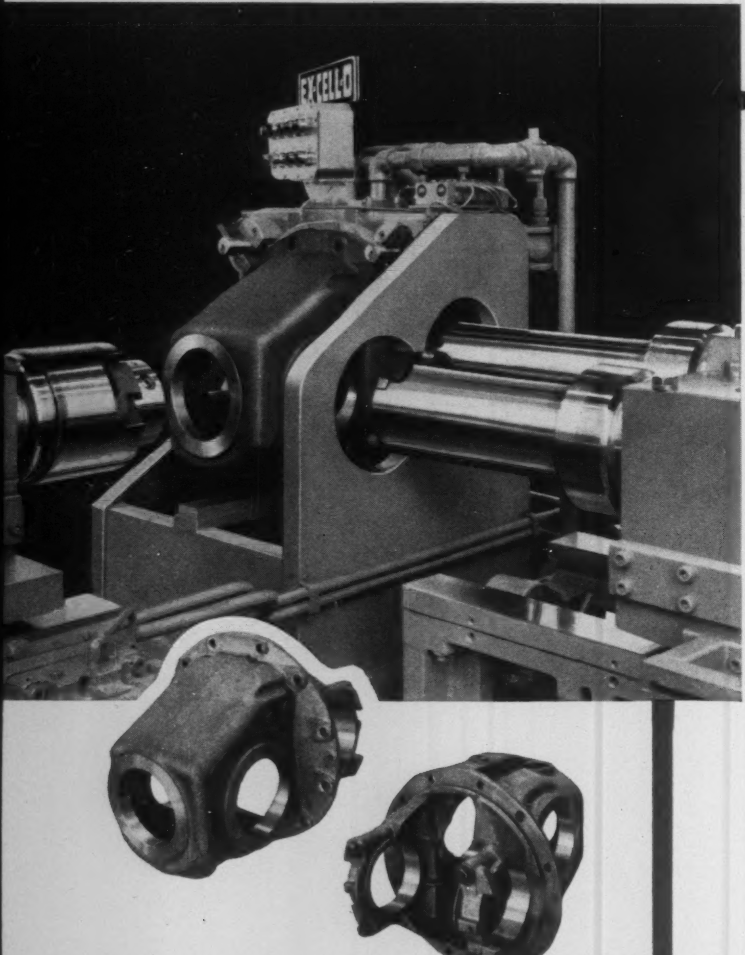
The Business Issues In the '60 Election p. 85

Steelworkers Plan New Strategy p. 73

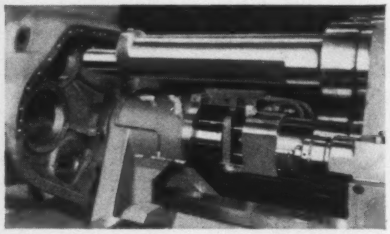
New Line Paints Wide Al Strip p. 113

Digest of the Week p. 2-3

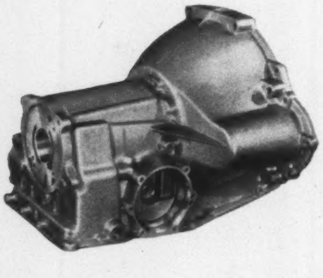
Ex-Cell-O Custom Machines Specialize in Difficult Jobs!



◀ **HEAVY-DUTY BORING**—Custom Boring Machine uses three heavy-duty Ex-Cell-O Precision Spindles to simultaneously finish-bore four holes and bore-and-face a fifth hole in this 75-pound cast-iron housing in a 4½ minute cycle. Diameters are about 6"; tolerances are held within .001".



MULTI-DIAMETER BORING—In a single cycle, the long boring bar on this Custom Machine line-bores two holes while shorter bar below it bores a third diameter, and small spindle in foreground bores a dowel hole in this huge clutch and gear housing.



HIGH PRODUCTION—Aluminum transmission case shown above is turned 90°, rolled over 180° as it passes through a 24-station Custom Machine. Automatic operations include precision boring, facing, chamfering, radial milling, tapping, trepanning, air gaging and flushing. Output is 124 parts per hour.

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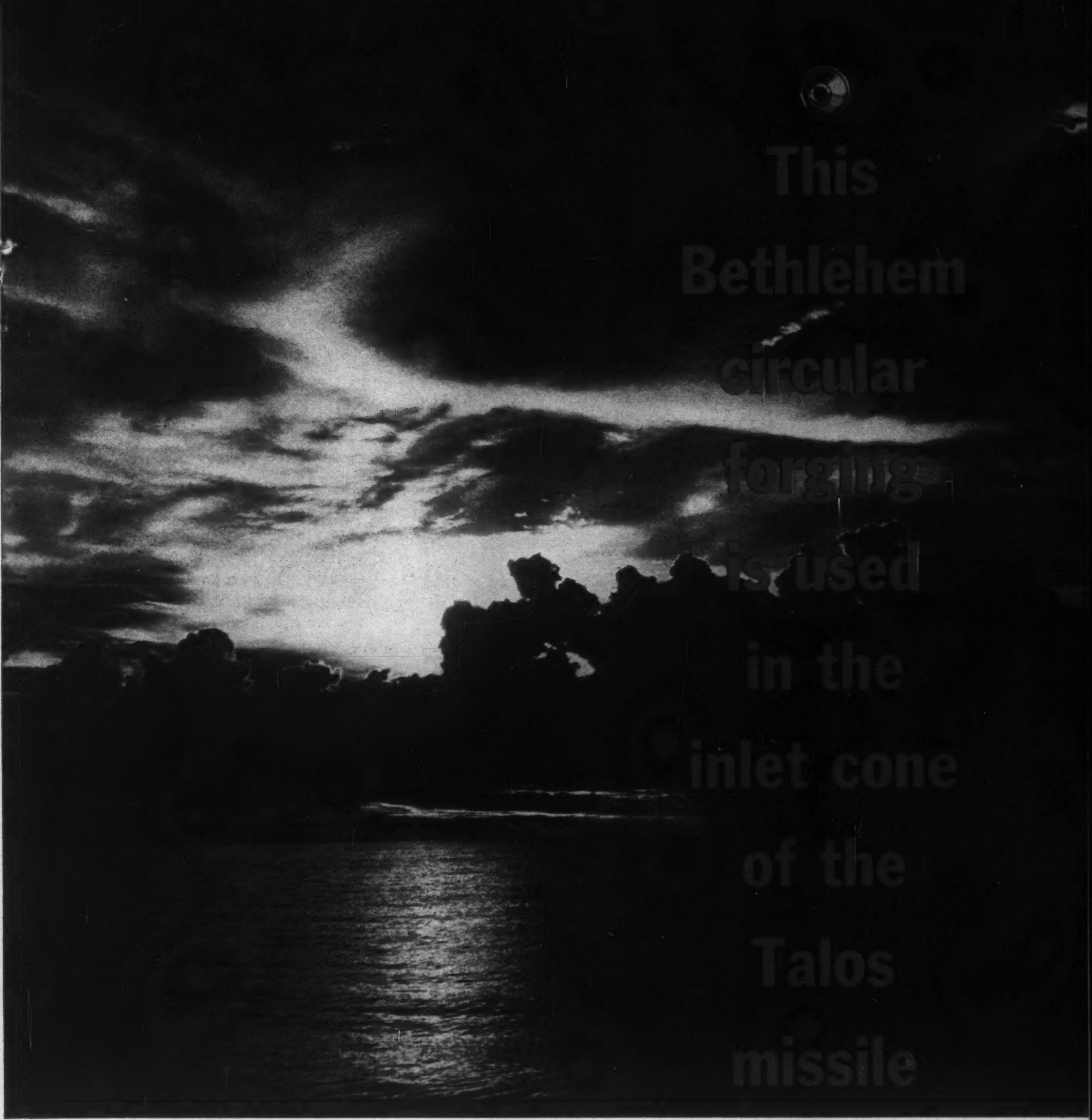
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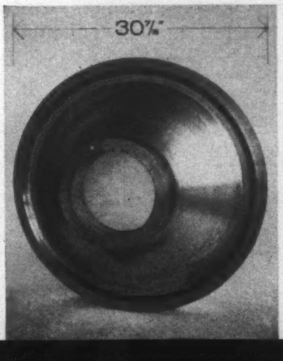

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The IRON AGE

September 29, 1960—Vol. 186, No. 13

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News of the Industry

STEELWORKERS MEET

Plan Future Demands — Delegates to the stormy USWA convention left no doubt that job security will be a key issue in 1962. Improved health and medical benefits are also high on the list. P. 73

STAINLESS STEEL

Fast Market Growth—Study by International Nickel predicts stainless steel use will grow at fast rate in the 1960s. Amount going into appliances, utensils, and cutlery should double between 1957 and 1967. P. 75

PRICING POLICY

Conflicting Views? — Both the Justice Dept. and the Federal Trade Commission act to prevent price abuses. But their differing views on what's right could put industry in the middle. P. 76

HOUSING OUTLOOK

Record Decade?—Home building could reach new records during the next 10 years. Population growth and increasing rate of new households boost demand. But realizing the full market potential depends on bringing costs under control. P. 78

AUTOMOTIVE

Greaseless Cars—Cadillacs won't

Metalworking

Cover Feature

BUSINESS ISSUES — Charles H. Percy, chairman of the Republican Platform Committee, gives the Republican viewpoint on important business issues in the 1960 election. He answers questions pertinent to the metalworking industry. P. 85

need lubricating this year. New innovations have eliminated the need for grease jobs. P. 91

REPORT TO MANAGEMENT

What Buyers Expect — Two factors will be important in deciding how active consumers will be in the months ahead. P. 83

Engineering-Production Developments

ALUMINUM-STRIP LINE

Yields Ready-Painted Coils—A new high-speed processing line paints both sides of aluminum strip. In one pass, it can apply different colors to each surface. Painted stock from the new line can be sheared, slit, formed and pierced without damaging the finished surfaces. P. 113

NEW WORM-GEAR FORMULA

Aids Designers — The AGMA recently adopted a new worm-gear rating standard. It features a new formula for rating all kinds of worm gearing. This formula consists of two separate terms. The first term is used to calculate output horsepower. Power loss at tooth mesh is computed by using the second ratio or term. P. 116

CERAMIC COATING

Resists Corrosion — Ceramic-metal surfaces may be the answer in designing structural members that must withstand the elements. Corrosion and high-temperature oxidation hit a wall of resistance in a new coating material. P. 118

PROGRESSIVE DIES

Punch 1800 Parts per Hour—A 50 pct reduction in the cost of making loudspeaker conehousings is the result of a well planned punch-press and die-modernization program. P. 120

HIGH-STRENGTH ALLOYS

No Forming Problems — New constructional steels combine high strength with welding and forming ease. A "restrained quench" retains formability, after the new alloys are homogenized. The new steels can be bent 180° without cracking or failure. P. 124

Market and Price Trends

WEST COAST

Supersonic Jetliner? — Prospects for supersonic jetliner are improving. Air Force is already studying transport for military use. If approved, Farwest planemakers will probably get the contract. P. 95

MACHINE TOOLS

Growing Bigger—The role of miniature parts for space age manufacturing is growing bigger constantly. Precision in design and balancing are becoming top phases of production. P. 97

STEEL SUMMARY

Some Optimism — Two factors give the market a better tone this week: A moderate pickup in new business plus the conviction that inventory control is finally ended. But the upturn will be gradual and the operating rate will probably peak at about 65 pct. Chrysler cutbacks hurt in Detroit. P. 165

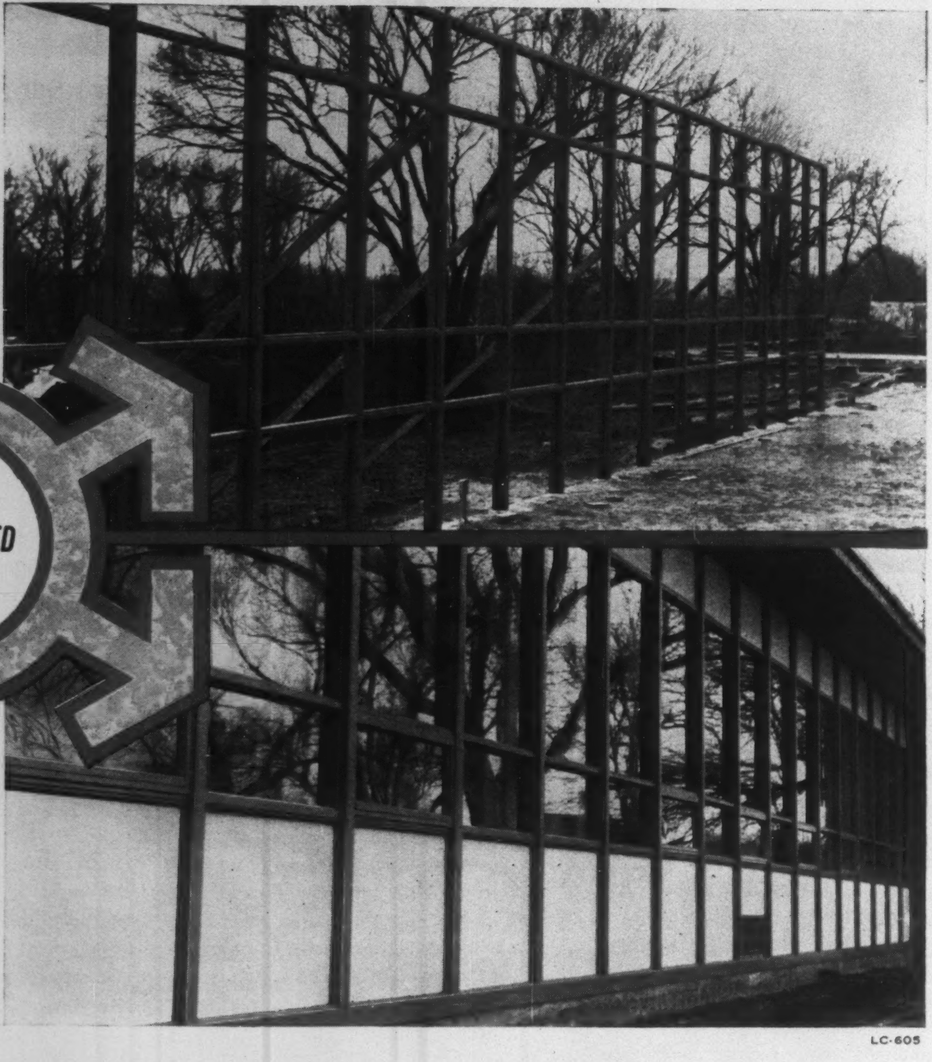
PURCHASING

No Hike — Gearmakers see no price increase in the immediate future although the industry is faced with a 6 pct wage jump shortly. This is after the fact that production has fallen off about 10 pct from 1959. P. 166

NEXT WEEK

HIGH-STRENGTH STEELS

Deserve Close Appraisal—High-strength steels are the subject of next week's special report on "How to Get More for Your Metalworking Dollar." It tells how these metals can economically and efficiently aid designers and fabricators.



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OUR NATIONAL ISSUES—PART 3

EDITORIAL

Our Future Growth: How Fast and How Much?

We are worried about our nation's economic growth. Political arguments confound this worry.

The forest of statistics is of little help to us. It is attacked by learned economists—on both sides of the political fence. When experts fail to agree, is it any wonder we are confused?

A bane of our present living is measuring what we are and what we do by what others are and what others do. Johnny must make the same grades or better than Jimmy. The Joneses must live up to the Smiths. The United States must keep ahead of Russia.

Competition is so expanded that some old-fashioned ideas have been dropped. Measuring ourselves against others as individuals or as nations is not bad. But, in doing this, we should know what we are measuring.

The best way to measure our growth is to measure it against ourselves—not against someone else. Where have we gone in the past 30 years? In the past 20 years? The past 10 years? Have we progressed? If not, why not? Have we grown dollar-wise only?

Look around you. Recall what things were like 10, 20, or 30 years ago. Has our country grown? Yes, it has. In growing, has it lost its regard for individual rights and privileges? The answer is, "No."

How well have we done by the poor, the sick, and the unfortunate? Are we run by strong men who foist their thoughts, plans, and idiosyncrasies upon us? The truth is we have nothing to be ashamed of unless it is a normal amount of human prejudices.

Do we still have the power to call a halt to things we abhor, or things we think will undermine us? We have it.

Should we grow three pct a year? Five pct? Ten pct? If so, who says so? And who will call the shots—the people as individuals, or the government as a master? Our free enterprise system gave us great growth—and it will give us much more. A look at the record—and at our nation—proves this.

The day we go too far over to socialistic trappings is the day we cease to grow adequately as a nation—and as responsible citizens.

We will grow rapidly and greatly to the extent that our people are allowed true economic liberty—guarded over by a responsible government which polices excesses and helps to rectify basic social injustice.

Tom Campbell

Editor-in-Chief

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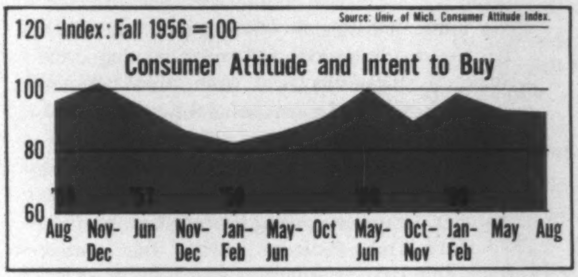
Consumers Haven't Given Up

Consumer confidence isn't collapsing; in fact, it's a trifle stronger. The general mood is hesitation, according to the University of Michigan's Survey Research Center's latest survey of consumer intentions. The index of consumer attitude, based on August interviews, was 93.3 (fall 1956 = 100). This compares with 91.7 in May.



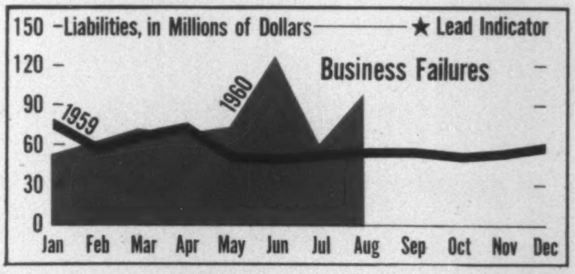
Included in the index are eight questions to disclose the consumer's opinion on such subjects as long and short-term business outlook, market conditions, and personal finances (see p. 83).

Appliance Outlook Pessimistic

Appliance makers, suffering from one of their most disappointing years, are less than optimistic about 1961. One big Midwestern maker (not Borg-Warner, see right) sees a decline of from two to three pct in most major lines next year. Only grounds for optimism: They've been wrong before.

Business Failures Climb

Business failures, which have not recently indicated a real pattern, reflected big losses during August. In fact, according to Dun & Bradstreet figures, the business casualties (1315) were the highest August in 27 years. Dollar liabilities hit $97.6 million. This volume was exceeded in recent years only by June of this year. (See chart.)



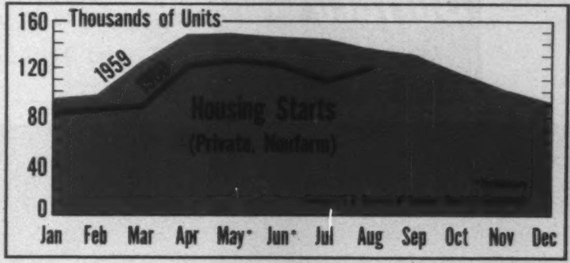
National Price Resistance

A wide range of signals indicate the country is in a general mood of price resistance. Some symptoms: Failure of a number of school bond issues (generally as safe as a vote against Communism); the rise of the compact car; manufacturers' blunt statements that they just won't take higher material prices.

This means more emphasis on cost-cutting in the plant, elimination of wasteful practices, and, inevitably, greater resistance to wage and fringe increases in new labor contracts.

Home Starts Pick Up

New home starts recovered in August from the substantial decline in July. At that, the August (seasonally adjusted annual rate) figure of 1.275 million is well under the 1.45 million rate of a year ago. In private nonfarm starts, a total of 120,700 new homes were started, up from the 113,300 total of July and about equal to June.



Trapped in "Numbers Game?"

More businessmen are beginning to suspect that business is not necessarily going to expand as the population increases. One of these is Judson Sayre, head of Norge Div. of Borg-Warner. Business, he says, was "trapped in the numbers game this year." The consumers multiplied, he said, but did not follow the prescribed behavior. His prescription: Determination and marketing skill decides successful growth.

What About Inventories?

The inventory question is as much alive as any in the business picture. And no pattern is emerging as yet. But one thing is certain. No forward buying is going on in any segment of metalworking. Joseph Block, Inland Steel chairman, says, "I can recall no time in the last 20 years when people have done as little forward buying as they are doing today."

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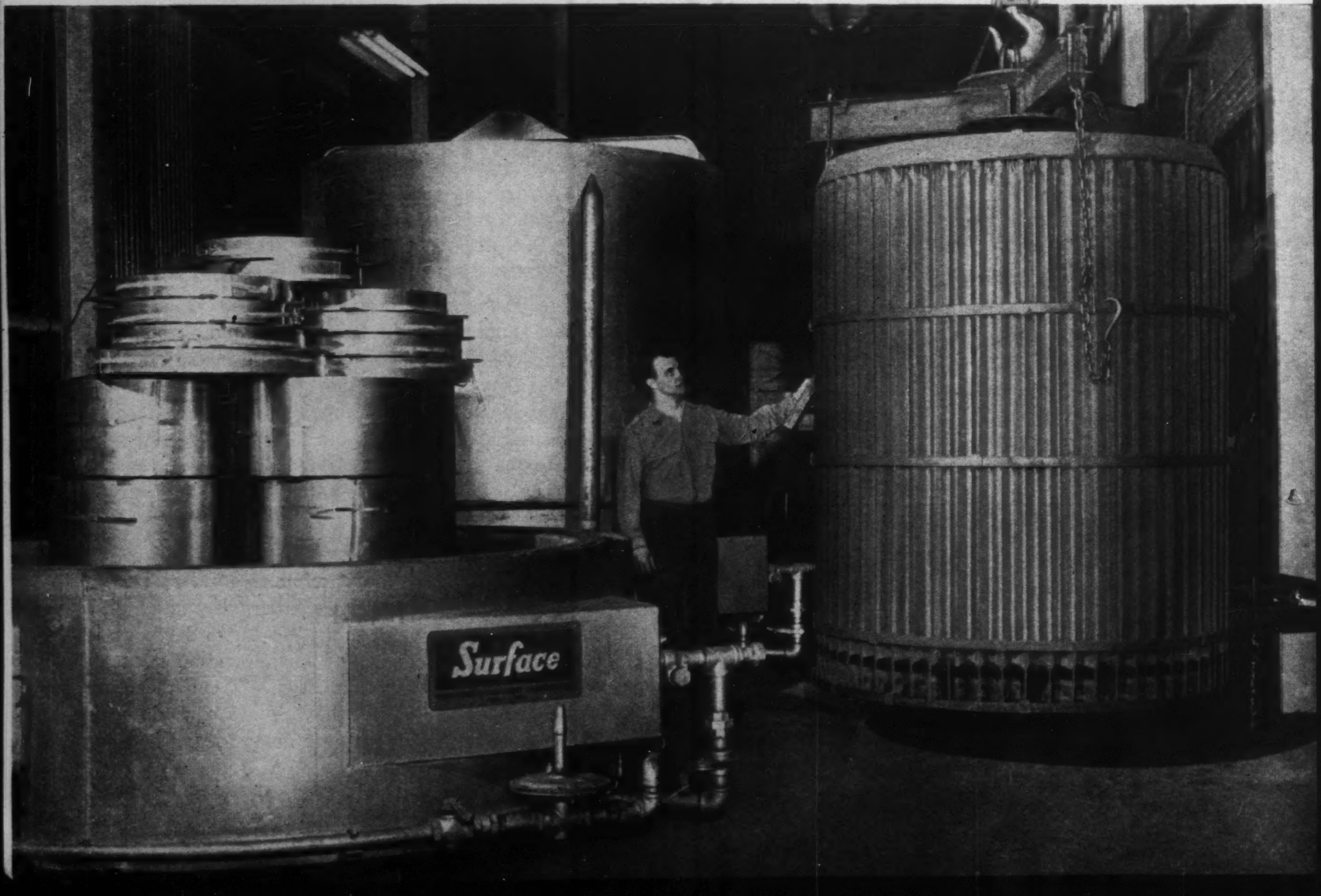

AFL-CIO: Seek Key To Organizing Problems

Union membership has been dropping rapidly in recent years. UAW has lost 500,000 of the 1.5 million men formerly enrolled. USW membership has dropped 400,000 below the 1.25 million members of a few years ago.

In the past few years, large industrial unions have turned organizing efforts increasingly toward the rapidly expanding white collar groups. As yet, these efforts have been disappointing.

Failure to win white collar groups has many union officials worried. But they aren't ready to ditch organizing efforts in this area.

For example, IUE has established an engineering council of international rank to concentrate on engineering and technical employees — now largely unorganized. An enlarged organizing staff goes into action Oct. 1. Says IUE candidly: "We must have a program for these workers, for they are our future."

AFL-CIO Organization Director J. W. Livingston told the second convention of the United Papermakers and Paperworkers that AFL-CIO unions have won more NLRB elections over the past year than in the preceding year.

AFL-CIO unions are meeting stiff competition from independent unions which are "on a rampage," according to Mr. Livingston.

Mr. Livingston blamed labor's organizing difficulties on the fact the easy plants have been won, backwash from McClellan Committee hearings, internal feuds among AFL-CIO unions, and reversal of NLRB policies since 1953.

Chrysler, Pennsy Lay Off Workers

Employment is beginning to wobble in key industries. Pennsylvania Railroad laid off more than 3000 union workers last week; may lay off more. In addition, all salaried workers making less than $18,000 get a two-day furlough during the last two weeks of this month. Other salaried groups may be affected.

By the end of next week, Chrysler Corp. will have laid off 5000 of its 105,000 employees as it trims output of 1961 models. Most Chrysler plants will be affected.

Pennsy blames its cutbacks on losses incurred during its recent strike, slowness of business in coming back after the strike, complicated by generally depressed business conditions, and rising costs of operations.

Indirectly, Chrysler blames the Pennsy strike for its layoffs. The company has already produced more than 100,000 1961 cars. It explains that it expected "adverse effects" from the Pennsy strike which turned out to be not as serious as anticipated.

Labor Conference Fails Its Mission

The labor-management summit conference fostered by President Eisenhower is just about dead.

High Dept. of Labor sources say the group, three labor leaders and three management representatives, probably will meet once more and then quietly call it quits.

Labor Dept. officials privately lay most of the blame on management which, they claim, entered the talks with anything but good faith.

USWA: Rebels Clobbered

OMR isn't a new government agency. It's a rebel group of steelworkers called Organization for Membership Rights, formerly the Dues Protesters.

Interest in the group surged last week when two of its members got mauled on the convention floor. (see p. 73).

First clash came when a member of OMR tried to pass out literature on the convention floor. This is against the rules.

The next surge of the rebels and anti-rebels came when insurgent chairman Donald Rarick was attacked while he was talking to a lawyer at the back of the hall.

OMR has charged that the intent was to pick its members off one-by-one, and that top officers of the union knew it. This was charged in a telegram Mr. Rarick sent to Labor Secretary James Mitchell, who was about to give his talk when the fracas started. The FBI is now investigating the complaint.

David J. McDonald, Steelworkers' chief, claims the insurgents provoked the fights. A complete investigation has been promised by the union. But OMR has preferred charges against the union via the Dept. of Labor.

The rebel group started in 1956 when it protested a raise in dues from $3 a month to $5. It also protested a raise for Mr. McDonald. In the 1957 election, Mr. Rarick polled about a third of the votes, a big protest vote.

The same man is running for president of the union again in the 1961 election. The publicity of the beatings may have some influence on the vote next spring.

CINCINNATI

Impressions at the Exposition . . .

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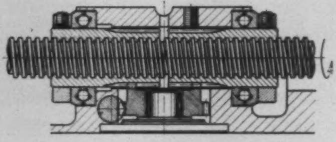
Many fine Feature-Advantages *are common to all*

CINCINNATI KNEE TYPE MILLING MACHINES

Knee type milling machines were much in evidence at the Exposition. Perhaps you did not have time, however, to see and compare all of them. This brief review will help you recall the Cincinnati exhibit of four fine knee types: a 5 hp Universal MI; a 10 hp Vertical Dial Type; a 15 hp Plain Dial Type, and a 50 hp Vertical Dual Power Dial Type.

Although these machines are within different power and price brackets, they have several common feature-advantages which keep the cost of variety milling at a minimum. Six are illustrated here, and there are many more.

No other machine tool builder gives you such a wide selection of fine knee type milling machines having so many profit-making features common to all. Complete details are outlined in catalogs No. M-2134 and No. M-1995-4. Write today for your copies, or telephone Cincinnati REdwood 1-2121. **Milling Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**



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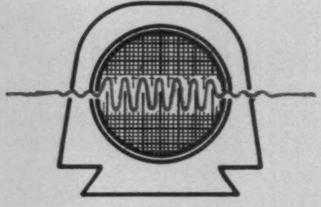

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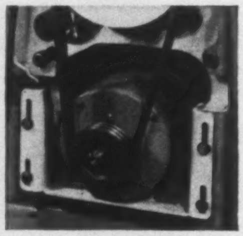

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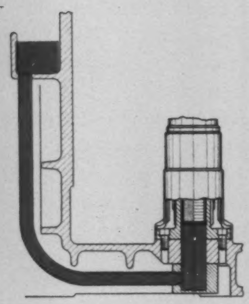

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ILLUSTRATIONS

A—Automatic backlash eliminator makes "down" milling and reciprocal milling a routine job.

B—Dynapoise overarm damps self-excited chatter.

C—Automatic, individual lubrication of vertical feed screw.

D—Arbor-Loc spindle nose, a quick change feature-advantage which takes standard arbors and collets.

E—Large speed and feed dials, clearly visible, direct reading type. Speed dial for High Power machines illustrated.

F—Cradle type motor mounting, to facilitate servicing of motor and belts.

CINCINNATI®

BUILDERS OF FINE MACHINE TOOLS: KNEE TYPE AND BED TYPE MILLING MACHINES • DIE SINKING MACHINES • CUTTER AND TOOL GRINDERS • ELECTRICAL MACHINING EQUIPMENT

MILLING MACHINE DIVISION

WASHINGTON

Metalworking Newsfront 3

By R. W. Crosby

★Trade Drive Lacks Funds

The much-ballyhooed drive to expand U. S. exports will get off the ground this month, but it won't get very far. In fact, it is destined to move at something less than half speed for the next nine months.

The reason, as usual, is money.

Of a total of $3.3 million requested to fully implement the government's export expansion program, Congress allowed only $1.1 million. The program almost failed to get a single cent. While the Senate was okaying the entire appropriation, the House turned thumbs down on the whole thing.

In the compromise by House and Senate conferees, the U. S. Dept. of Commerce, prime mover of the export drive, got $800,000 of the $1,800,000 it sought.

The Department of Agriculture asked for a half-million dollars to beef up its farm exports. It got $237,000.

It was the State Department which took the deepest slice. The department needed more than a million dollars to add 50 new overseas posts for the program. It got $125,000 from Congress, about two tenths of the requested appropriation.

Planners of the drive are now meeting to figure ways they can cut their big plans down to the size of their appropriation. No matter what they decide, they can't go any further than the money will take them. And that's not even half way.

■ Weapon System Contracting Hit

Critics of waste in defense buying have turned their guns away from the Pentagon, momentarily. They are now aiming at industry.

Investigations of weapon system contracting led to charges that prime contractors, in efforts to do work they are not fitted for, are running up unnecessary costs in millions of dollars.

More Defense Dept. control over contractors' production is the inevitable outcome.

The claim of investigators is that lack of production experience does not deter contractors from "costly and often futile experiments" in making specialized components. Meanwhile, they say, competent smaller companies find their specialized knowledge ignored.

Their major recommendation: "Weapon system prime contractors must be educated to the point of view that, in daily 'make or buy' situations, their responsibility to the government must precede what they may consider to be the best interests of their company."

■ Depreciation Survey Delayed to March

The U. S. Treasury Dept.'s depreciation survey probably won't be ready until March. This is the estimate of Treasury officials who would like to have it much earlier.

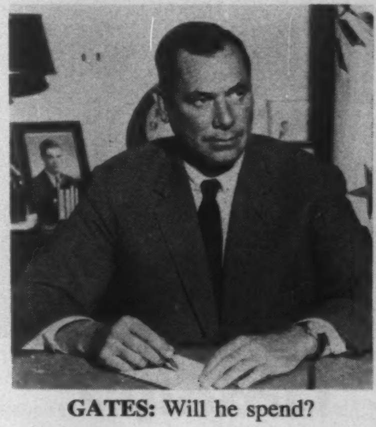
Two reasons they would like to have the final tabulations before January: One, the department heirarchy would like to get credit for the job in case they are out of office after the election. Two, they would like to have it ready for the next Congress, which convenes in January.

The problem: The surveys cannot be pushed through Univac until they are all together. Though the Sept. 1 deadline is long past, some important companies have not filled out their questionnaires. There is talk in the department of putting some pressure on tardy companies even though answering the survey is voluntary.

■ "Excess" Defense Funds Studied

Defense Secretary Thomas S. Gates, Jr., now is considering how to use the remaining extra funds Congress voted above Administration requests in the defense controversy early this summer.

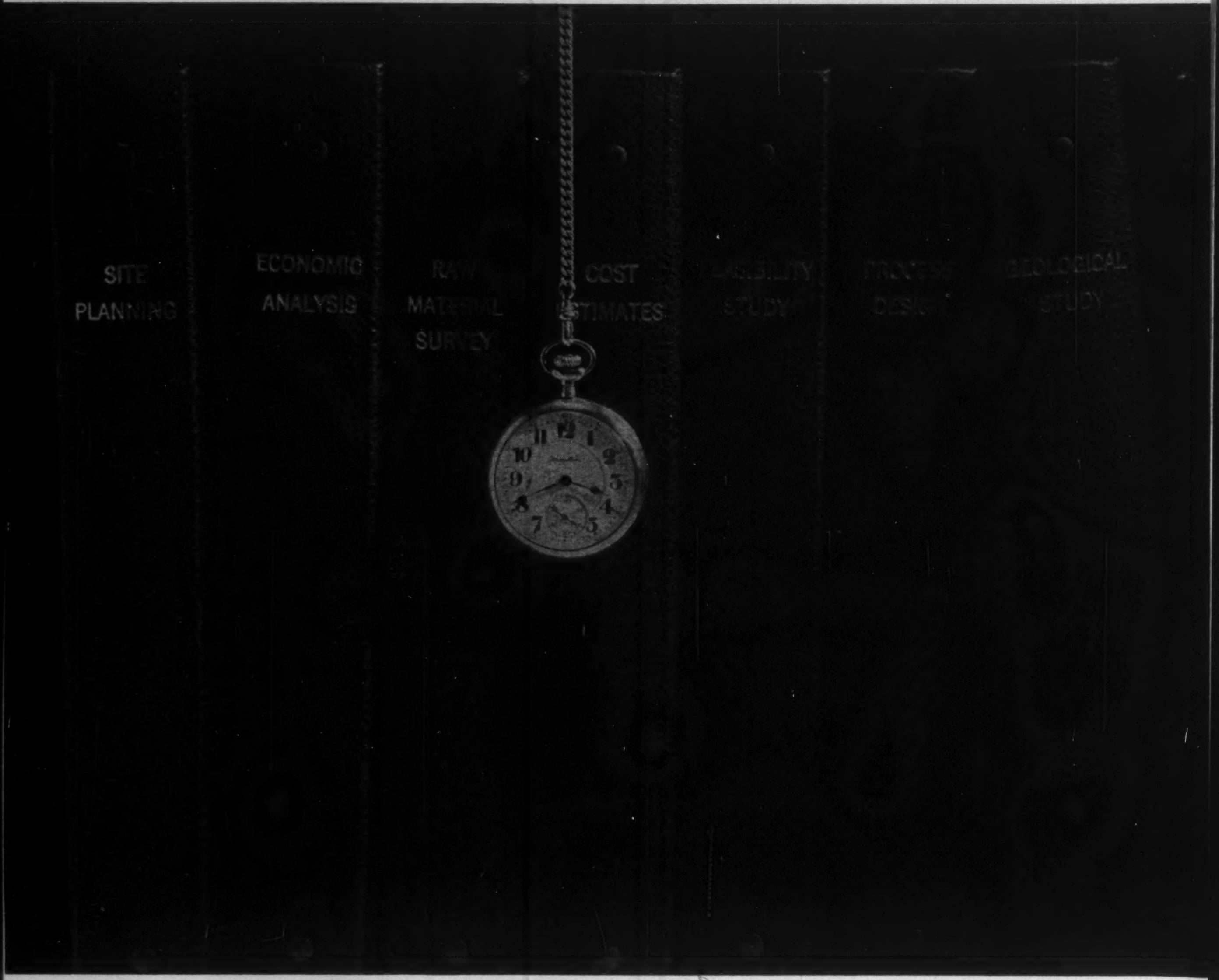
Despite whatever objections the Administration originally had, officials disclosed that more than $600 million has been earmarked for use out of the extra $1.1 billion voted in June. More than $121 million has been allocated since Senate Democratic Leader Lyndon B. Johnson charged — and President Eisenhower denied—that the extra funds were "impounded."



GATES: Will he spend?

Gates indicated some of the items which may now claim more money are weapons and equipment for Army modernization, the B-70 bomber program, and the long-range version of the Polaris ballistic missile.

Pre-Engineering by **KAISER ENGINEERS** answers basic plant expansion questions...


SITE PLANNING
ECONOMIC ANALYSIS
RAW MATERIAL SURVEY
COST ESTIMATES
FEASIBILITY STUDY
PROCESS DESIGN
GEOLOGICAL STUDY

Timely? Many complex factors shape the final decision to proceed with your expansion plans...and timing is an important one. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. The studies and evaluations furnished by KE Pre-Engineering represent only one phase of total KE services. Kaiser Engineers designs and builds for the Steel industry...offers skilled experience in all types of facilities from raw material plants to finishing mills. From Pre-Engineering through design and construction, Kaiser Engineers provides complete, one-company service and ingenuity based on years of experience.

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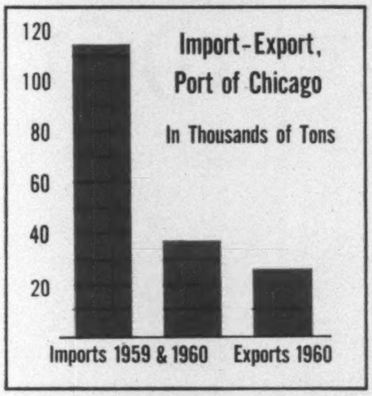
Chicago Steel Exports Climb Over 1959 Levels

Exports through the Port of Chicago totaled 423,000 tons for the 1960 shipping season through Aug. 1. Imports for the same period were 146,000 tons.



The big decline in imports was in steel mill products. Imports through July of 1959 totaled 115,594 tons as against 38,026 for the same period in 1960. The high import rate last year, however, was brought about by the steel strike.

Structural stone, marble, alabaster, granite, etc. were high on the import list. Automobiles and parts totaled 6,800 tons.

The downward trend on steel imports held true for the entire St. Lawrence Seaway. Latest statistics from the St. Lawrence Seaway Development Corp. show incoming shipments through the Montreal-Lake Ontario section during August were off 39 pct. In the Welland Canal section they dropped 34 pct.

Incoming tonnages in the Montreal-Lake Ontario section were 1.2 million this year. This is 800,000 tons below 1959. At Welland they were 600,000 tons below 1959, or 1.1 million tons.

Exports in these areas show improvement over 1959. The gain was 20.8 pct out of the Montreal section, and 7.6 pct through the Welland Canal.

Crucible Steel Joins Common Market

Crucible Steel Co. of America may have set a precedent by purchasing 75 pct ownership of a foreign speciality company. The move will now enable Crucible to enter and participate in the European Common Market, something that has proved very difficult for U. S. steelmakers. It may also point the way for other steel companies.

The foreign company, Founderie Acciaierie Milanesi Vanzetti, S. P. A., of Milan, Italy, produces high speed, tool and stainless steels in bar form and cast products.

Crucible president Joel Hunter says Vanzetti will continue to operate with its present management and employees under the name of Acciaierie Crucible, S. P. A.

European Steel Output May Cut U. S. Exports

There is a hidden fact in the significance of rising steel exports to Europe: The fact that wide cold-rolled sheets have been one of the hottest items going out of the country.

It is being used for auto and appliance production in West Germany, Great Britain and Sweden. But now comes the word that in most of those nations new installations are going forward to provide items that have been in short supply, namely wide cold-rolled sheets.

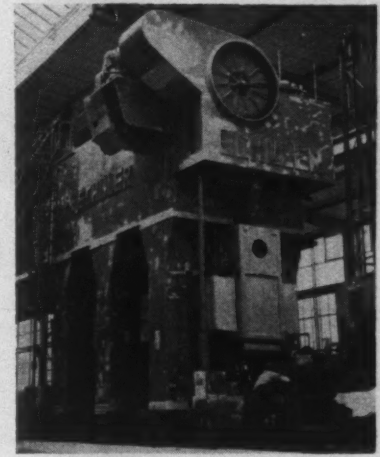
A major increase in production of these sheets overseas could cut deeply into U. S. steel sales abroad.

Also, some foreign nations are planning to greatly step up steel exports in the next few years. Sweden, for example, has embarked on a big oxygen steelmaking program to increase output.

German Manufacturers Have Full Order Books

American companies which have been buying dies and tooling in Europe for a long time are running into shortages. Die firms specializing in automotive work won't take on any more business. Best delivery time for larger dies is now nine months.

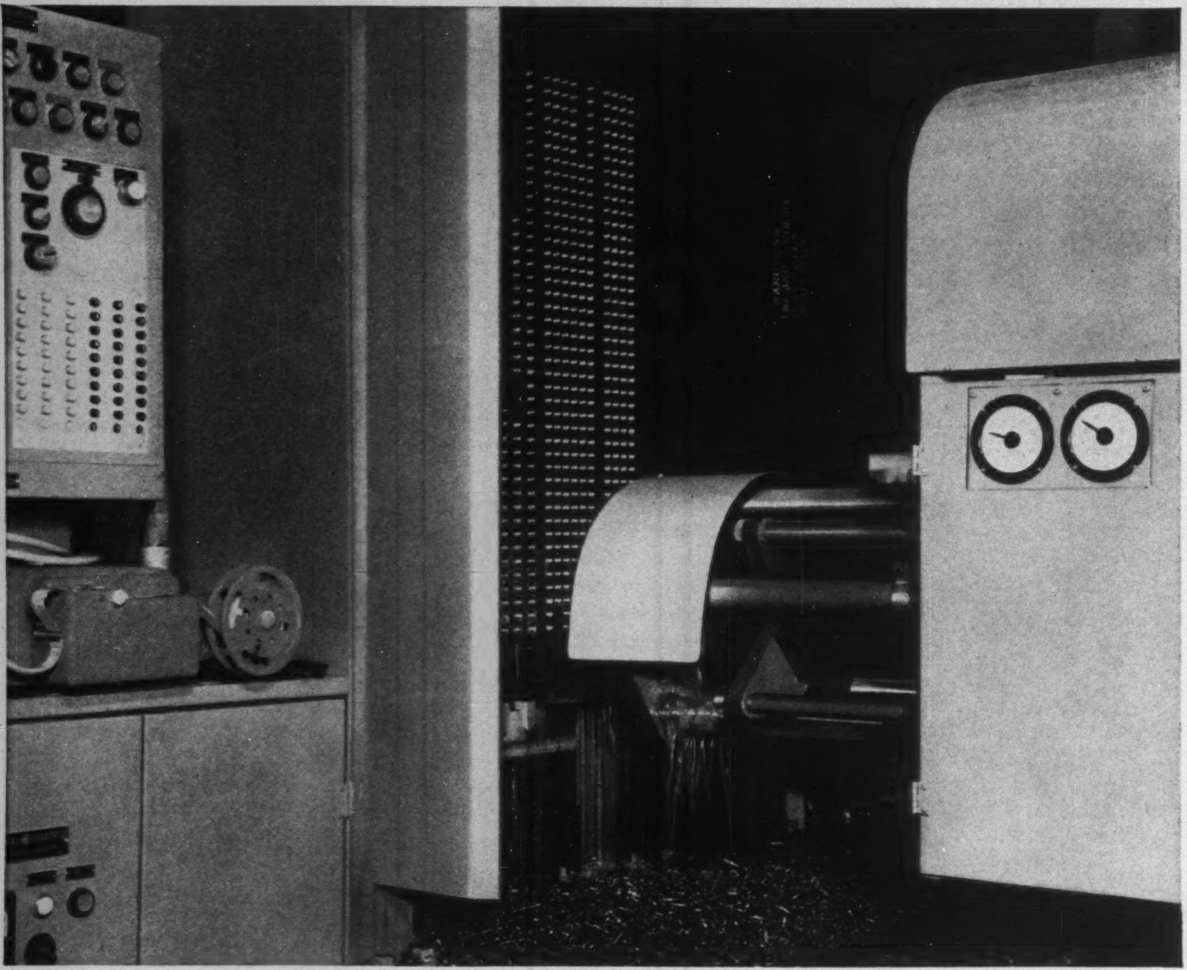
The present German steel supply situation closely resembles the situation in the U. S. during the Korean conflict. Sheet and structural orders must now be placed nine months in advance. Cancellations are allowed only up to 90 days before promised time of shipment.



ON EXHIBIT: German machinery.

This is one reason for the increase of cold rolled sheet to Western Europe by American steel mills.

At the same time, much of West Germany's production is going for export. An example is the 320 ton steel press, above, exhibited at the Hanover Fair. The press is capable of exerting a pressure of 3000 tons, and is being shipped to Moscow.



"40 IPM AT *875 rpm*... WE WERE AMAZED"/ *says Walter P. Hill*

DATA:	1020 LEDLOY LEADED PLATE 1½" THICK	1020 NON-LEADED PLATE 1½" THICK
PENETRATION RATE Production Run	40 IPM	20 IPM
DRILL SPEED Production Run	875 RPM	750 RPM
MAXIMUM IPM Test Run	up to 47	up to 28
CHIP CHARACTERISTICS Thickness Temperature Type	 .060—.080 cool broken	 .040—.060 cool curled

"Ours is a specially designed numerically controlled jig drilling machine with which we obtained penetration rates of 20 Inches Per Minute at 750 RPM in standard half-inch thick 1020 steel plate. However, with the same set-up, we easily obtained 40 IPM at 875 RPM in INLAND LEDLOY leaded steel plate three times as thick and with far better tool life.

■ "Actually, in LEDLOY, we reached penetration rates of 46 and 47 IPM but consider the 40 IPM more practical for production runs. Our programmed test run was made on steady plates for large condensors in which 1½" LEDLOY steel plates were used. As a control, equivalent drillings were made in non-leaded plates of the same chemistry and the same thickness. Our load meter showed the same pulled load on LEDLOY at 40 IPM as we pulled on the non-leaded plate at 20 IPM. Tool life using LEDLOY plates at 40 IPM was equal to tool life using non-leaded plates at only 20 IPM.

■ "We conclude, and without hesitation state, that LEDLOY displayed a marked improvement."

Walter P. Hill

Walter P. Hill, President
WALTER P. HILL, INC.
DESIGNERS AND BUILDERS
SPECIAL AUTOMATED MACHINES
DETROIT, MICHIGAN

LEDLOY®
the world's most machinable steels

INLAND STEEL COMPANY INLAND
30 West Monroe Street, Chicago 3, Illinois

New Sling Sounds Warning

A new concept in sling chains uses a warning ring to provide visual evidence of overloads. When overstressed, the ring elongates. Being stronger than the chain itself, the ring issues its warning before permanent damage to the sling can occur. The warning ring protects both men and materials.

New Uses For Lithium

Researchers find that the lithium resources of the world are adequate to supply foreseeable needs. The outlook at present is for new uses and gradual increases in consumption in its various forms. Possible new uses include well-drilling muds, bleaches, light-metal alloys, propellants, cermets, oil additives, and liquid metal heat transfer agents.

Grinders Reclaim Coils

Abrasive-belt machines in tandem, grinding in oil, remove stock from stainless strip up to 28 in. wide. These grinders produce good finishes and hold close tolerances in a single pass. This permits the completion of orders in 12 hours instead of the former 65. The new grinding line also removes deep imperfections and salvages entire coils which formerly called for remelt.

Flaw-Free Die Material

Die steels for large diecasting blocks may soon go to vacuum melting. At least one large manufacturer is supplying vacuum-melted material for tests in this application. Diecasters are interested. They want to avoid the losses that come when a flaw is found after extensive machining.

Bright Anneals Stainless

Watch for a new vertical bright annealing furnace that's designed to remove surface oxides from the payload. This furnace uses a high-purity reducing atmosphere to combat element loss such as nickel from stainless steel. With the surface nickel oxidized, materials like type 430 stainless would corrode rapidly. Pickling is eliminated because of the bright surface finish provided by the furnace atmosphere—key to the process.

X Rays Check Plating

X-ray methods are fast becoming the best and sometimes the only means of getting quantitative data on plating thickness. They are rapid, nondestructive and accurate. X rays can even measure plating thickness on complex, odd-shaped parts. By using metal masks, point-by-point thickness checks can be made. These checks show how a plating thickness varies over an irregular surface.

Gun Drill Strikes Deep

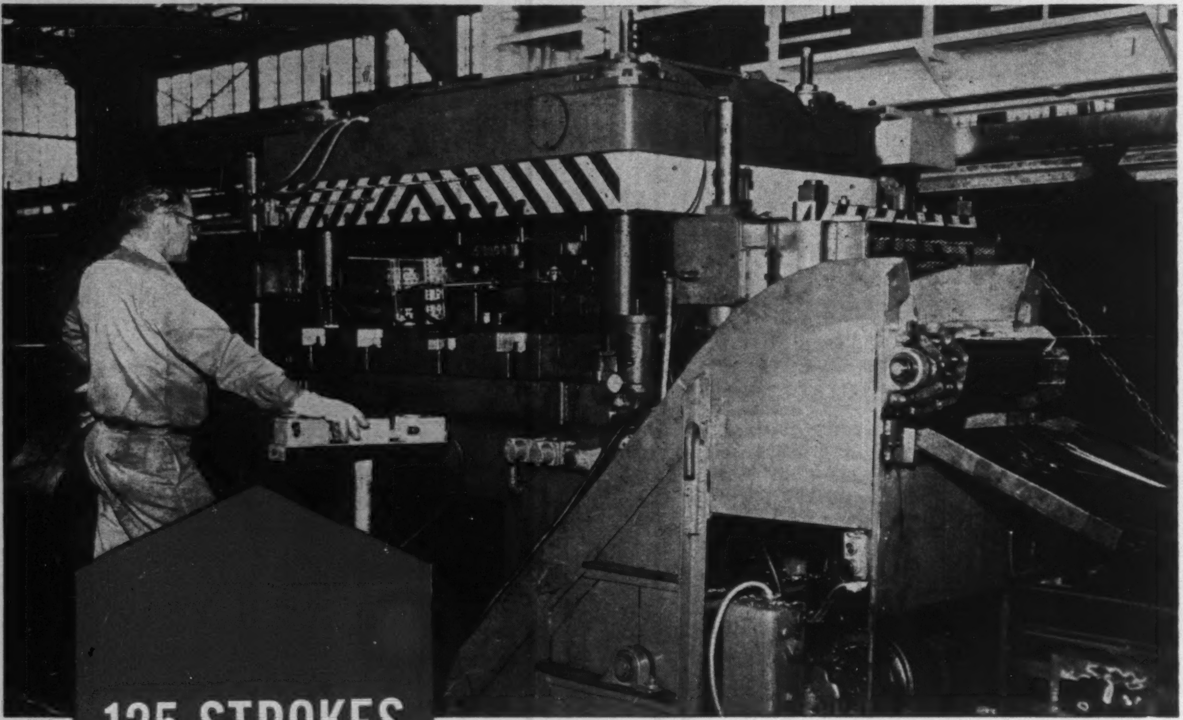
Demonstrated at the Machine Tool Exposition was a new production gun drilling machine that is capable of cutting deep strokes in tough heat treated alloys. The unit handles depths to 24 in. but machines with strokes up to 48 in. will soon be available. The gun drill is designed to reduce whipping and vibration normally found at high rotational speeds.

Designed to the Need

Possibly the first use of a major tonnage of low-alloy, high-strength steel in a major office-building structure begins this week. A 40-story building will get underway—with the first 23 stories consisting of a framework of U. S. Steel's Cor-Ten. Reductions in total tonnage of steel required for the structure offset the higher base price of the alloyed steel.

Faster Thread-Grinding

A special grinding wheel saves $1500 per month for a midwestern worm-gear producer. This aluminum-oxide wheel has a fine-grain, soft-grade, medium-open structure with a vitreous bond. In 85 seconds, the wheel removes 0.02 in. of stock with three roughing passes and one finish pass. As a bonus, the new wheel also reduces the previous rejection rate of 300-600 worms per day.



125 STROKES PER MINUTE on a 300 TON PRESS with a 6″ STROKE

This is a lot of strokes per minute for a 300-ton automatic press especially on a part requiring a 6″ stroke. This is one of the reasons why The Budd Company, Philadelphia, chose high production Henry & Wright Dieing Machines. They also needed flexibility for a wide range of short-run jobs; accurate die guiding to assure minimum wear on expensive, multi-stage progressive dies averaging 8-stages each; automatic material feeding and parts ejection; quick and easy die changing . . . all so necessary to stay profitable in the highly competitive stamping business.

You'll find Henry & Wright machines will meet every production requirement. The 6″ stroke, high tonnage job described in the headline is a severe test for any heavy automatic press. If you need more production, at competitive costs, for a variety of jobs, ask now about the high production Henry & Wright machines. Your inquiry will receive our prompt attention. Sizes from 25 to 500-ton capacity.

THE HYDRAULIC PRESS MANUFACTURING COMPANY
A Division of Koehring Company • Mount Gilead, Ohio, U.S.A.

HPM

H41

LETTERS FROM READERS

Enlightening

Sir—Please send me reprints of the series of four articles written by S. A. Tucker on the subject of planned profits. The articles of this series that I have read are certainly enlightening and cover the same subject I am studying in the evenings, namely production control and management.—Louis J. Mathews, H. H. Robertson Co., Ambridge, Pa.

- **Copies will be sent.—Ed.**

On 'Exec Failures'

Sir—In The IRON AGE Special Report to Management, Dr. F. J. Gaudet has done an excellent job in reporting the findings of the Stevens Institute of Technology studies of reasons for executive failures. There are many things that could be said of this article in the way of praise. It is so well written and easily understood that I would like to have 15 copies of this and his coming articles for distribution to management people under my direction.—W. W. Wilkinson, Armco Drainage & Metal Products, Inc., Atlanta, Ga.

- **The copies will be sent.—Ed.**

Sir—I enjoyed the article on reasons for executive failure very much. You indicated that copies would be available. If this is still so, please send me one.—R. L. Brooks, Woodbury, N. J.

- **It's on the way.—Ed.**

Sir—After reading the article in your September 8 issue entitled "Reasons for Executive Failure," I would appreciate your sending me two copies. I found it very interesting and I am sure that some of the future executives of this company will also find it of great interest.—D. J. Flaim, Joseph Dixon Crucible Co., Jersey City, N. J.

- **The two copies are enroute.—Ed.**

Sir—By far, this is the best article of its type I have ever read. I would appreciate four copies of the reprint on the story about executive failures.—Grant B. Names, Baltimore, Md.

- **The reprints have been mailed.—Ed.**

Sir—The article "Reasons for Executive Failure Point Way to Success," written by Dr. F. J. Gaudet, was very interesting. I would like to obtain two extra copies for distribution.—H. W. Kampfert, Ford Motor Co., Ypsilanti, Mich.

- **Copies will be sent.—Ed.**

So Sorry!

Sir—In the Oct. 24, 1957 issue of The IRON AGE I clipped out the article entitled "New Temperability Calculator." Just recently I had an occasion to use the method described and found it to be quite useful. I would like to obtain the reprint of this article if you have any remaining.—Rodney Wallace, Illinois Iron & Bolt Co., Carpentersville, Ill.

- **Sorry, but our supply of reprints has already been exhausted. However, you might try your local library which, if the article is available, would probably be glad to offer you a photostatic copy.—Ed.**

Valuable

Sir—It was with great interest that I read the last of S. A. Tucker's planned profits articles, "Living Ratios Produce Formulas to Gage Capital Evaluation," in a recent issue of The IRON AGE. As a product analysis specialist in Chrysler Corp.'s Forward Profit Plan department, I believe this article would make a valuable contribution to our library. If possible, please send me a reprint.—Frederick T. Seaberg, Garden City, Mich.

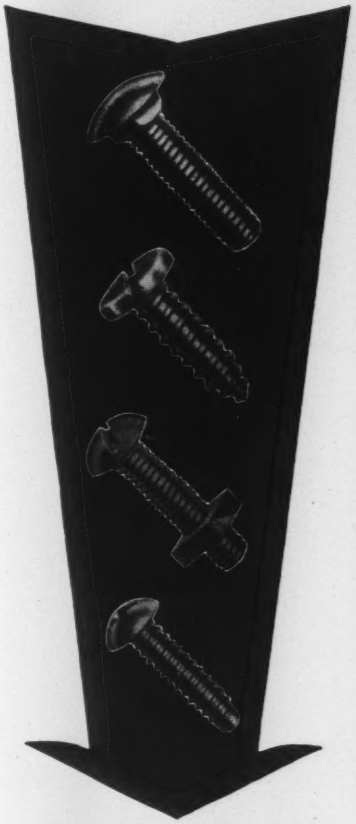
- **The reprint is in the mail.—Ed.**

For Files

Sir—Your recent article on "Ratio Systems Appraise Sales" interests me very much. I would like to have a copy for my file and possible further study.—J. R. Mantel, Milwaukee Crane, Cudahy, Wis.

- **It is on the way.—Ed.**

YOUR BEST SOURCE FOR STANDARD FASTENERS



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Southern fasteners are sold through leading distributors located throughout the nation. These sources are supplied from Southern's amply stocked warehouses or from our stock of over 1,500,000,000 fasteners at the factory and main warehouses in Statesville, North Carolina.

Let Southern's Stock List guide you in the selection of standard items immediately available from stock. Write on your company letterhead to: Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

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INTEGRATED AUTOMATION
BY GENERAL ELECTRIC

G. R. BROWN, Manager of General Electric's Metal Rolling and Processing Sales, talks about new automation capabilities at General Electric.

Integrated Automation

"General Electric is ready now to assist you with the ultimate in automation . . . automation of your entire plant."

To date, General Electric has concentrated on the complex problems of automating your individual processes. Now, with actual installations completed, individual-process automation has become a reality. General Electric has now taken the next logical step in sound automation planning.

With newly developed products and system technology, General Electric engineers can now link your "islands of automation" to provide complete automation of an entire production area.

With this major phase of your automation program complete, it then becomes possible to link automated production areas by means of a master computer-control system, thus providing completely integrated automation of the entire plant.

Based on a step-by-step modernization approach, General Electric's plan provides flexibility for technological and economic developments in your company. At the same time, it enables you to begin now, taking advantage of the many benefits of automation.

For example, the first step in integrated automation has already been taken by many metal producers. New rolling mills automated by General Electric are automatically keeping strip "on gage" to minimize scrap and boost yield. Primary rolling costs are being reduced through application of G-E programming and

means effective control of your entire plant

computer systems. G-E automated systems will eliminate charging errors in many blast furnace operations, increasing furnace profits. In many mill operations, G-E automated systems are making available, immediately, critical data in the most usable form to permit wise and timely management decisions resulting in improved and more consistent product quality, reduced operating costs and optimum utilization of the mill.

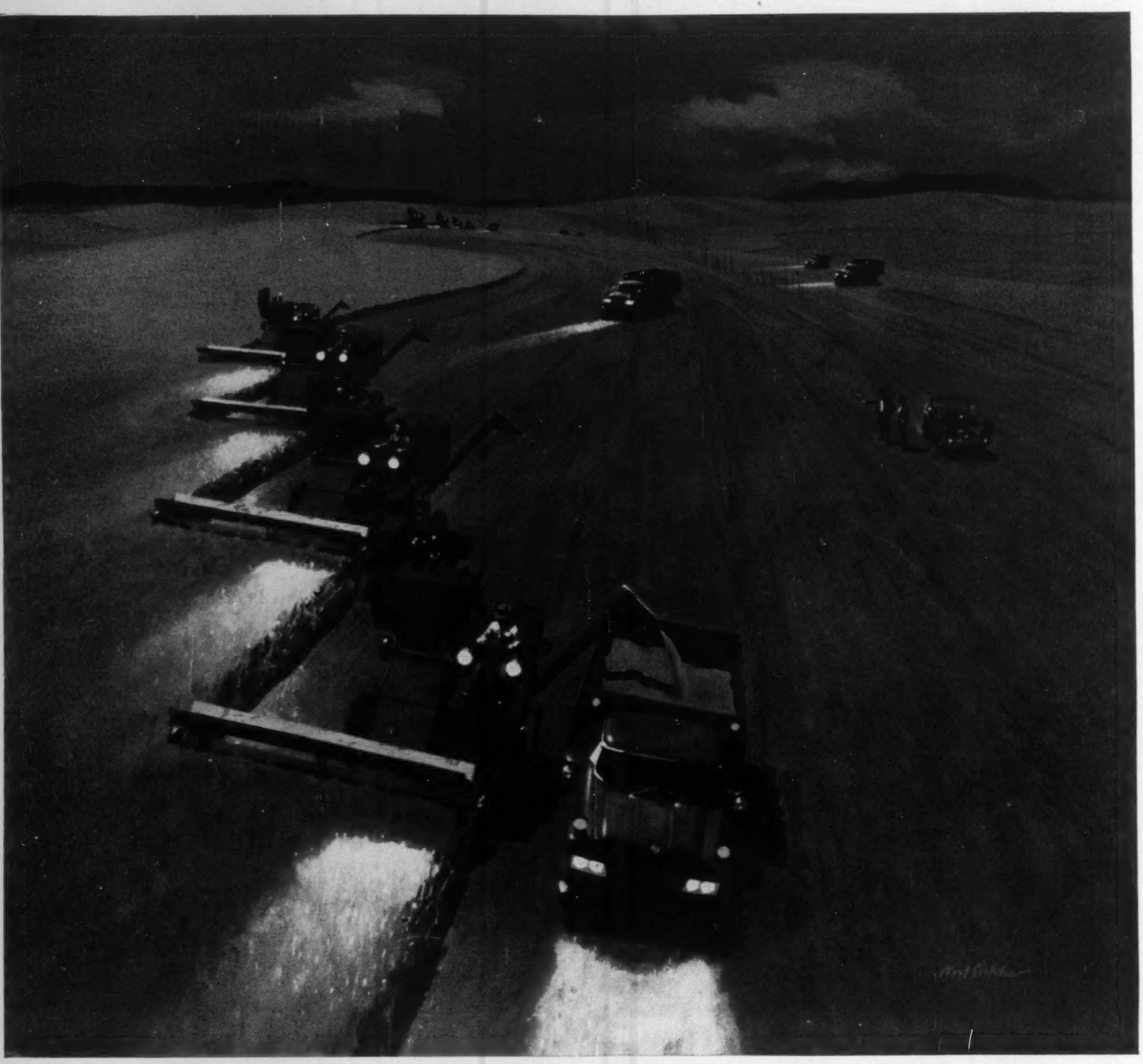
The next step for many of these metal producers will be the linking together of "islands of automation." By application of General Electric automatic computer-control equipment, greatly improved programming for an entire sequence of processes will result. All operations can then be effectively measured and evaluated early enough to allow modifications that will quickly satisfy conditions in any individual process. An entire production area will become responsive to directives originating from a central source.

Finally, as production areas are linked by a master computer-control system, completely automatic production scheduling and manufacturing throughout the entire plant will result. Over-all performance will be in direct accord with management decisions based on incoming orders, related process operations, materials inventories and all of the many complex variables that determine profitable plant operation.

Let General Electric begin working with you now in your planning for future profits. You'll find that the capability to provide the ultimate in automation is a reality at General Electric today. For more details, call your nearest Apparatus Sales Office. General Electric Company, Section 659–131, Schenectady 5, New York.

AUTOMATION THROUGH MODERNIZATION

GENERAL ELECTRIC

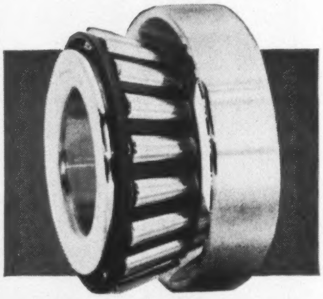


RUSH SEASON . . . marathon harvesting proves bearing stamina

Sunup to sundown is only half a day's work during rush seasons on the farm. Farm machines follow their headlights long into the night. And Bower roller bearings help them take the long hours of overtime work in stride.

This 'round-the-clock work load calls for bearings that hold up when the heat's on. The significant advantages of Bower roller bearings . . . in basic design, in materials, in manufacture . . . keep combines, tractors and other farm machinery rolling longer, season after season.

Build overtime service into *your* product with Bower roller bearings. You'll find this extra endurance in the full Bower line of tapered, cylindrical and journal roller bearings for every field of transportation and industry. Bower Roller Bearing Division, Detroit 14, Michigan.



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ROLLER BEARINGS

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STEELMAKING AT JESSOP

Experience counts . . . and Jessop has it

There is no substitute for experience in making steel for the reactors of nuclear submarines like the Nautilus, the Skate and the Polaris-firing George Washington. Jessop's activity in nucleonics dates back to the early days of the Manhattan Project.

Today, Jessop's still at it—continuing research, improving techniques, piling up experience in making sophisticated steels to harness the atom. And Jessop is out front in other steelmaking fields too.

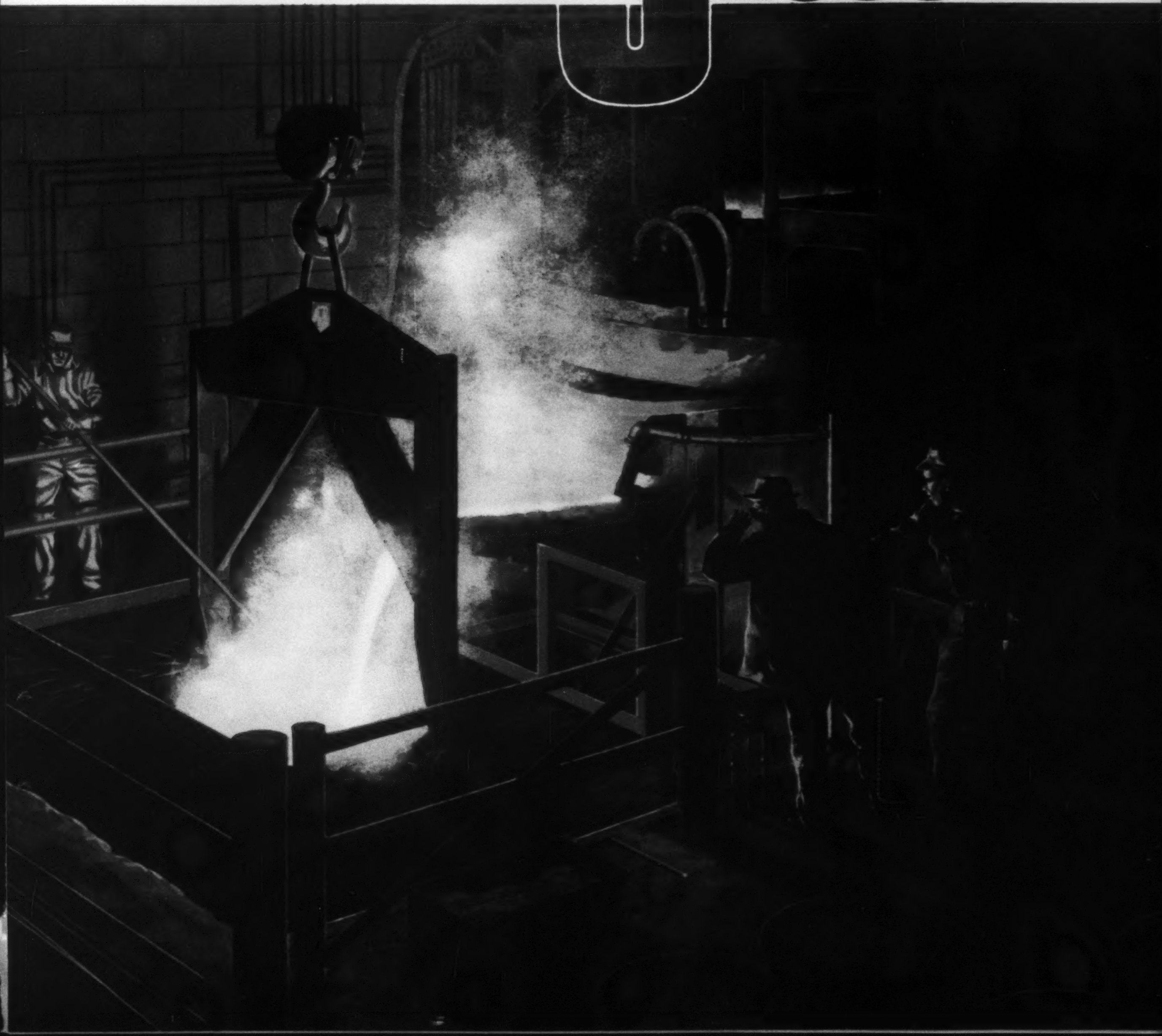
Whether you use heat- or corrosion-resistant stainless steels; abrasion- or shock-resistant steels; nonmagnetic or precision ground steels; high speed, cast-to-shape, clad or alloy steels, you can be sure of the quality—and *service*—you'll get when you do business with Jessop.

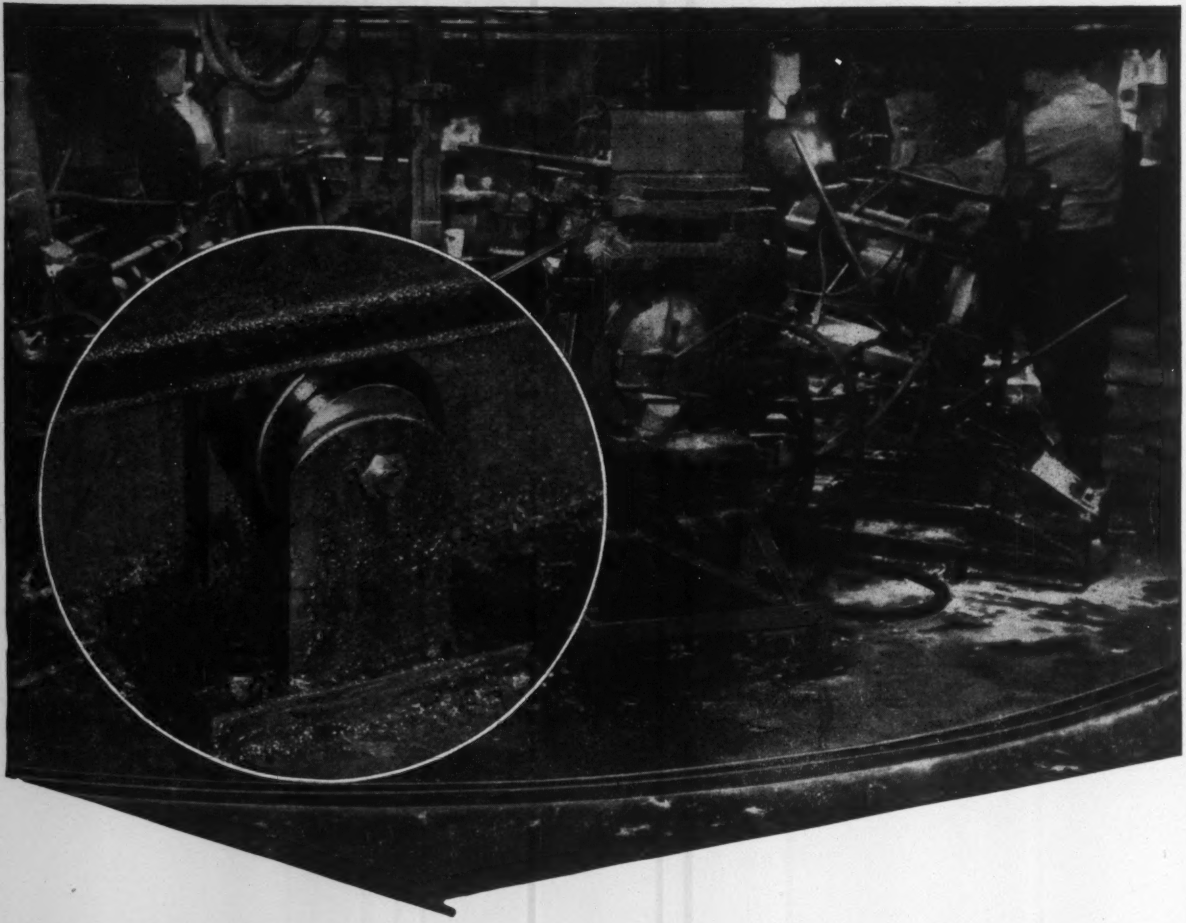
In quality steelmaking experience counts, and Jessop has it. Call a Jessop sales office in any of 23 major cities of North America and discuss *your* needs for specialty and alloy steels.

Jessop Steel Company
Washington, Pennsylvania

Plants and Service Centers:
Washington, Pa. • Los Angeles • Chicago • Detroit • Owensboro, Ky. • Wallaceburg, Ont.

JESSOP





Bearings, Inc. turned this turntable from a costly maintenance problem into a smooth, trouble-free operation!

Our customer, an aluminum foundry, designed and built this system for continuous and automatic pouring of permanent mold castings. The turntable is approximately 20 feet in diameter. Supporting the table, which weighs several tons, were 20 large, double-row bearings. The life of these bearings was only a few weeks and their cost, plus downtime was becoming increasingly expensive.

Our bearing engineers were asked for a solution and, after an investigation, recommended a camroll bearing. Now, after many months of operation, all turntables in the plant are equipped with the bearings we recommended and there has not been a bearing failure in that period!

If you have a problem involving bearings, call the Bearings, Inc. branch nearest you for expert help. We are the authorized distributor for all the bearings we sell —your guarantee that the bearings we deliver will be of the latest manufacture and right for your application!

Providing bearing service in the North ➤ **BEARINGS, INC.**

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FATIGUE CRACKS

Editorial Vacation

Ever wonder what an editor does on his vacation? We have the answer, provided by Machinery Editor Ralph Eshelman.

He spent part of his annual due attending the famous Bread Loaf Writers' Conference at Middlebury, Vt. The conference, one of the most famous in writing circles, is sponsored annually by Middlebury College and attracts top members of the writing world as well as educators from leading colleges and universities.

Once there, the conferees spend a great deal of time studying advanced writing techniques, talking with other writers to get a broader viewpoint of everyday happenings, and working to develop a higher polish for their own work.

At the Top—It was in the talks with other members of the conference that Editor Eshelman heard some comments that made him, and us, beam with pride. One of the Bread Loaf teachers, a widely known magazine writer and educator of the University of Chicago, told the writers that The IRON AGE was considered as one of the highest-rated publications in the industrial field. He said the magazine has gained this reputation because of "its clear and incisive writing style."

And others at the conference told our man that the clarity and terseness of style have placed The IRON AGE high on their reading list.

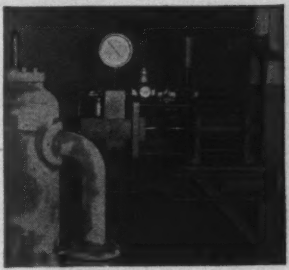
The Notaries—To illustrate the caliber of cohorts our editor found in his midst he lists a few impressive names. William Sloan, editor of Rutgers University Press; Bernard Asbell, University of Chicago and well-known writer; Richard Gehman, a top magazine writer and author of a new book on magazine writing; Louis Koenig, author of "Invisible Presidency," "Presidency Today," and other nonfiction best sellers, and Allen Drury, whose novel "Advise and Consent" won the 1960 Pulitzer prize and is now in production for a Broadway play were all there.

It may seem like a busman's holiday, but the conference serves to better acquaint writers with their fellows and gives better insight to the problems of today and the future.

BREAD WINNERS: Machinery Editor Ralph Eshelman, right, and best selling author Allen Drury advise and consent on events at the annual Bread Loaf Writers' Conference held recently at Middlebury, Vt.

WANT RELIABLE HYDROSTATIC TESTING TO 50,000 PSI?

Aldrich Air-Driven Hydraulic Pumps are rugged, compact . . . the perfect answer for production or laboratory needs . . . Operate on normal plant air . . . Immediate shipment from factory stock.



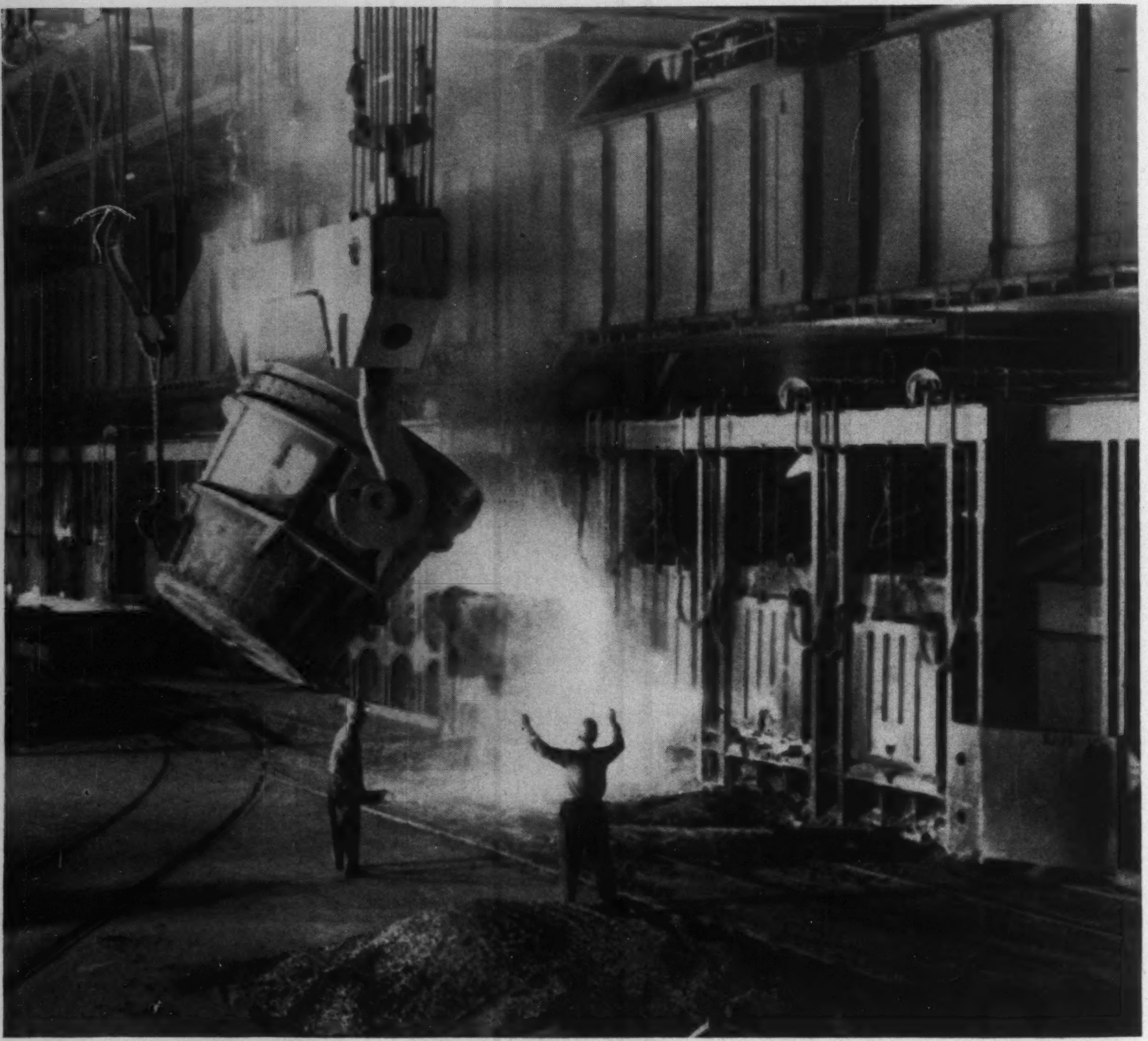
FOR HIGH PRESSURE VESSELS—Maker of unfired pressure vessels tests production units with Aldrich air-driven hydraulic pump, in accordance with A.S.M.E. Boiler and Pressure Test Code.

OR CASTINGS—Castings and forgings for missile, nuclear, and other industries are tested in this rig on a production-line basis. Source of hydraulic pressure is an Aldrich pump. This unit has capacity of 12,100 psi. Other pumps available for pressures to 50,000 psi. Special units to 100,000 psi.

Aldrich air-driven hydraulic pumps are dependable, economical to operate and easy to install. Write today for Data Sheet 36 (6-inch stroke) or Data Sheet 36A (3-inch stroke).

ALDRICH

ALDRICH PUMP COMPANY
8 Pine Street, Allentown, Pa.



What in blazes can't B.F. Goodrich hose stand

How an improved kind of hose keeps furnace doors from melting

It's 3000 degrees hot inside those open hearth furnaces. So hot that the heavy steel doors would melt in minutes except for the hose that carries a stream of cooling water in and out of them.

Trouble was that the hose used to burn out after only 2 or 3 weeks. White hot blasts of heat cook it. Hot metal spatters it. Often big "charging machines" bang into it.

The B.F.Goodrich distributor, servicing the steel mill, asked what we could do to solve this problem. BFG engineers designed, tested, rejected—finally developed a rubber hose, wrapped with asbestos for heat resistance, armored with braided stainless steel wire for strength.

Where other more expensive hose burned out in a matter of a few weeks, the B.F.Goodrich hose is good for *3 or 4 months* of constant use. What's more, the improved BFG hose is much lighter, more flexible, easier for workmen to handle. One man can install it where two were needed for other hose.

B.F.Goodrich makes hose to carry almost anything—from blasts of air to torrents of water; for scalding steam, corrosive chemicals, abrasive sand. Any one of our BFG distributors can explain the different types of hose we make, tell you what to expect from each, help you decide which is your best buy. *B. F. Goodrich Industrial Products Co., Dept. M-915, Akron 18, Ohio.*

B.F.Goodrich

COMING EXHIBITS

Mining Show—Oct. 10-13, Convention Center, Las Vegas, Nevada. (American Mining Congress, 1200 18th St., N. W., Washington, D. C.)

Metal Show—Oct. 17-21, Convention Hall, Philadelphia. (American Society for Metals, Metals Park, Novelty, O.)

Die Casting Exposition & Congress—Nov. 8-11, Detroit Artillery Armory, Detroit. (The Society of Die Casting Engineers, 19382 James Couzens Highway, Detroit 35.)

Western Tool Show—Nov. 14-18, Memorial Sports Arena, Los Angeles. (American Society of Tool and Manufacturing Engineers, 10700 Puritan Ave., Detroit 38.)

Power and Mechanical Engineering Show—Nov. 28-Dec. 2, Coliseum, New York. (American Society of Mechanical Engineers, 29 W. 39th St., New York 17.)

MEETINGS

OCTOBER

Metal Lath Mfrs. Assn.—Fall meeting Oct. 6-7, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, Engineers Bldg., Cleveland.

The Electrochemical Society, Inc.—Fall national meeting, Oct. 9-13, Shamrock Hotel, Houston, Tex. Society headquarters, 1860 Broadway, New York.

American Gas Assn.—Annual convention, Oct. 10-12, Atlantic City. Association headquarters, 420 Lexington Ave., New York.

Pressed Metal Institute — Annual meeting, Oct. 10-14, Shawnee Inn, Shawnee-On-Delaware, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

Marking Device Assn. — Annual convention, Oct. 12-14, Hotel Roosevelt, New York, Association headquarters, 912 Chicago Ave., Evanston, Ill.

HOW TO BEAT THE HEAT

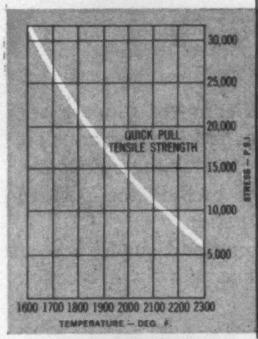
for strong high alloy requirements in the 1,800° to 2,300° F range!

DURALOY HOM*

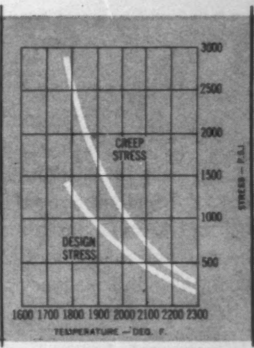
*Covered by U.S. Patents

casting alloy

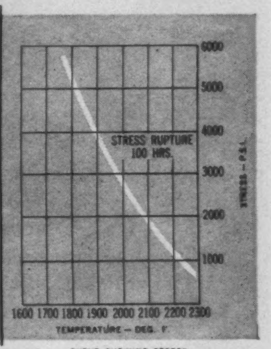
Duraloy "HOM" is a special high nickel alloy developed to produce castings that meet high temperature requirements, especially when castings are subject to oxidizing atmospheres.



CURVES SHOWING HIGH TEMPERATURE SHORT-TIME TENSILE STRENGTH OF DURALOY-HOM



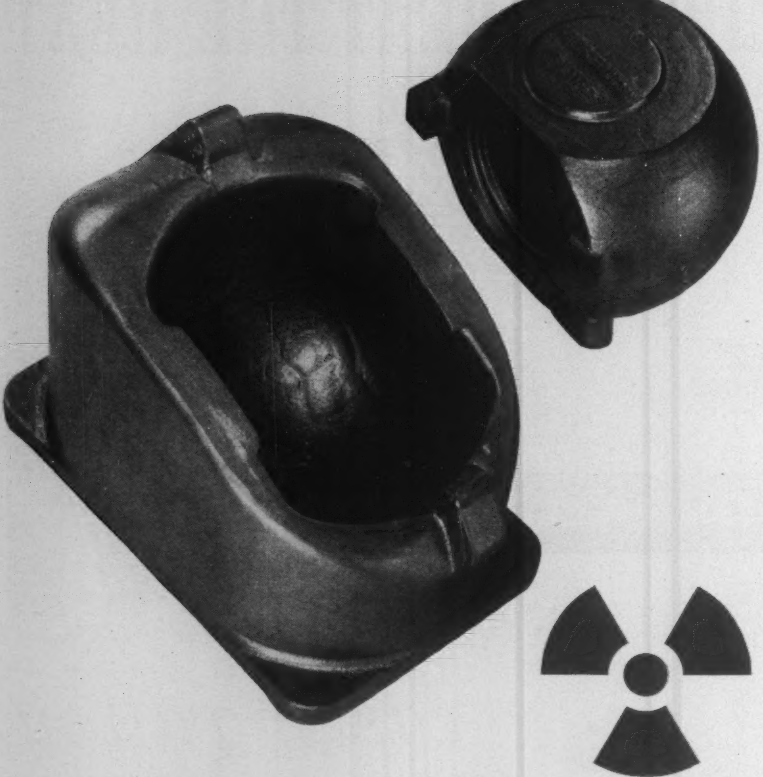
CURVES SHOWING CREEP STRESS FOR CREEP RATE OF 1% IN 10,000 HOURS AND RECOMMENDED DESIGN STRESS FOR DURALOY-HOM



CURVE SHOWING STRESS TO RUPTURE AT 100 HOURS FOR DURALOY-HOM

Castings of DURALOY "HOM" are now being produced by our three methods: static, centrifugal and shell molded. Write today for additional information on this versatile new alloy.

The DURALOY Company
OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.



RADIATION CONTROL

AccuRay® instrumentation is based on the radiation of gamma rays from a source unit containing radium-226 or cesium-137. Source units are effectively shielded by housings cast in Meehanite by Hamilton Foundry. The density, and soundness of Meehanite castings provide the positive protection essential for safe and reliable instrumentation.

When buying castings, the skill and integrity of Hamilton Foundry is your best insurance that specifications—and delivery schedules—will be met.

**AccuRay is the registered trade mark of Industrial Nucleonics Corporation*

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY INC.

1551 LINCOLN AVENUE • HAMILTON, OHIO • TWinbrook 5-7491

MEETINGS

Steel Boiler Institute, Inc. — Fall meeting, Oct. 12-14, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1308 Land Title Bldg., Philadelphia.

The American Society of Mechanical Engineers—Rubber and Plastics Conference, Oct. 9-11, Hotel Lawrence, Erie, Pa. Society headquarters, 29 West 19th St., New York 18, N. Y.

Gray Iron Founders' Society, Inc.—Annual meeting, Oct. 12-14, Netherland Hilton Hotel, Cincinnati. Society headquarters, 930 National City-E. 6th Bldg., Cleveland.

Industrial Management Society—Annual national industrial engineering and management clinic, Oct. 13-14, Conrad Hilton Hotel, Chicago. Society headquarters, 330 South Wells St., Chicago 6, Ill.

Non-Ferrous Founders' Society—Annual meeting, Oct. 13-15, Grove Park Inn, Asheville, N. C. Society headquarters, 1604 Chicago Ave., Evanston, Ill.

Magnesium Assn. — Annual convention, Oct. 17-18, Cleveland. Association headquarters, 122 E. 42nd St., New York.

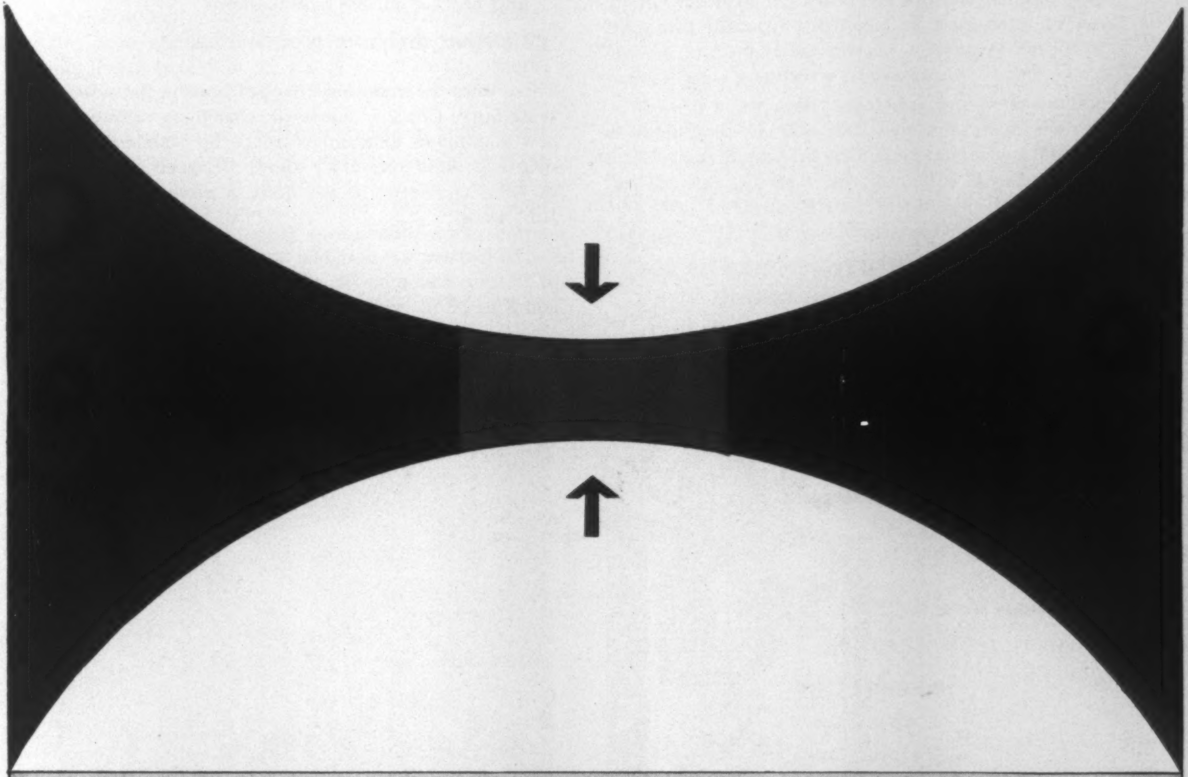
American Coke & Coal Chemicals Institute—Annual meeting, Oct. 17-18. The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 711 14th St., N. W., Washington, D. C.

Society for Non-Destructive Testing—20th Annual convention, Oct. 17-21, Philadelphia. Society headquarters, 1109 Hinman St., Evanston, Ill.

National Tool & Die Mfrs. Assn.—Annual convention, Oct. 19-23, Leamington Hotel, Minneapolis. Association headquarters, 907 Public Square Bldg., Cleveland.

Foundry Equipment Mfrs. Assn., Inc.—Annual meeting, Oct. 20-22, Greenbrier Hotel, White Sulphur Springs, W. Va. Association headquarters, One Thomas Circle, Washington, D. C.

You'll make better connections with **Western Brass**, because brass is easily—and firmly—welded, brazed, or soldered. With Western Brass you have the added confidence that comes from working with metallurgical specialists who analyze your blueprints to guarantee that you get sheet or strip in the right alloy, temper, grain size, gauge, and finish. You'll make it better with easy-to-bond brass. And you'll make it best with Western Brass—it's "tailor-made" to your individual requirements.



OLIN MATHIESON • METALS DIVISION • EAST ALTON, ILL., NEW HAVEN, CONN.

Western BRASS

NEW SLANTS ON HEAT PROCESSING FROM SELAS

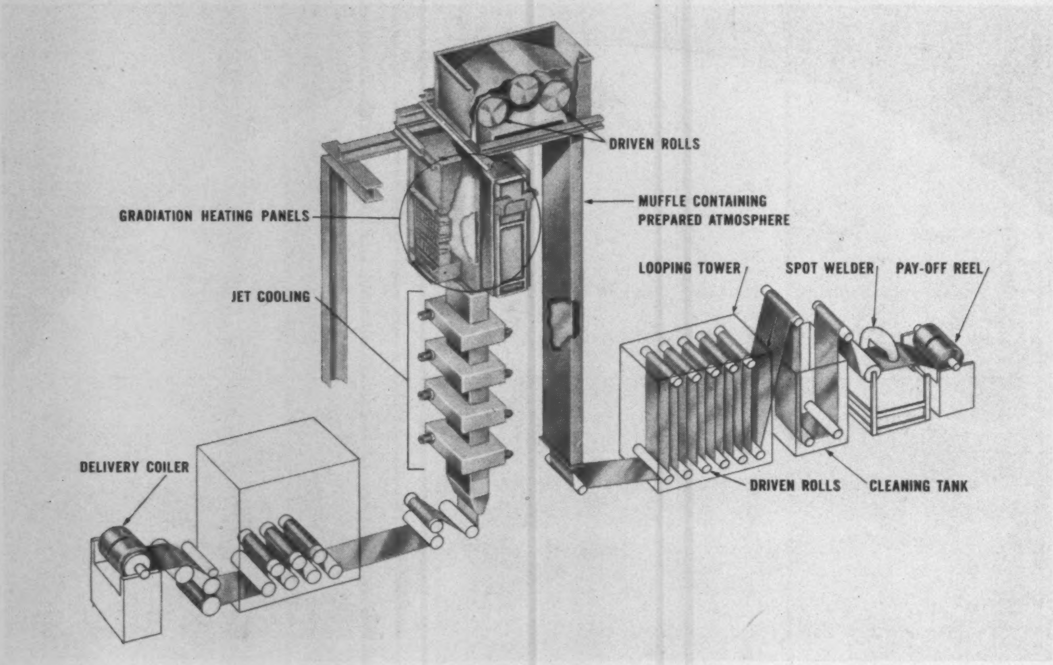
are these *your* objectives stainless strip continuous furnaces?

- ✓ **Top strip quality in terms of surface condition, microstructure, mechanical properties and flatness**
- ✓ **Uniform heating, with long muffle life and ease of muffle replacement**
- ✓ **Compact design to save floor space**

These were the main objectives of Somers Brass Co., Waterbury, Conn. — achieved when they selected a new continuous annealing furnace for stainless steel strip and other refractory alloys, designed and built by Selas engineers. It has been in production since July, 1958.

The furnace was designed for maximum strip speed of 50 fpm. It can handle strip 0.001 to 0.020 in. thick and 8 to 26 in. wide.

Up and over vertical design saves valuable floor space, provides controlled atmosphere protection. Available in 2000, 4000 and 6000 lb/hr capacities.


DRIVEN ROLLS
GRADIATION HEATING PANELS
MUFFLE CONTAINING PREPARED ATMOSPHERE
LOOPING TOWER
SPOT WELDER
PAY-OFF REEL
JET COOLING
DELIVERY COILER
DRIVEN ROLLS
CLEANING TANK

in selecting annealing

The muffle (6 x 36 in. in cross-section) is arranged in an inverted U. The vertical lengths are 5½ ft. apart and the horizontal cross-over is about 27 ft. above floor level. Compared to horizontal muffles, this arrangement *requires less mufflle material, extends muffle life, provides uniform strip temperatures* and *improved atmosphere purging.* The entire strip line length is only 50 ft. Heating and cooling operations require only 10 ft. of floor space.

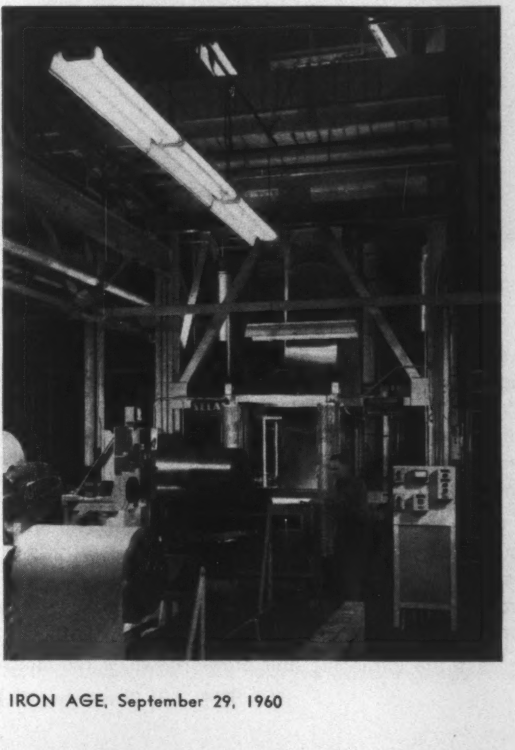
Selas Gradiation® method of uniform muffle heating in the two opposing burner panels, with burners patterned in four horizontal rows, assures uniform temperature across the strip width. The strip is equidistant from the radiating muffle-wall over its entire width.

Burners are fired by a gas-air mixture from a special Selas Combustion Controller installation. This premixes to a desired ratio and pressure, feeds through a single pipe system to the burners.

Somers' customers report improved die and tool life in deep-drawing operations with the stainless strip from this furnace—attributed to *uniformity of annealing,* and *improved surface completely devoid of surface oxide or other imperfection.*

Want to know more about this new Selas method of continuous stainless steel strip annealing? We can serve your needs for complete annealing line or furnace only. Contact our Steel Mill Division office, 300 Mt. Lebanon Blvd., Pittsburgh 34 (Phone: LOcust 1-0115) or our Furnace Division, Dresher.

SELAS CORPORATION OF AMERICA
19 Dreshertown Road, Dresher, Pa.



Total strip line length only 50 ft. Simple threading device, built into muffle system, permits rethreading in minutes, without loss of atmosphere, in event of tear-off of strip

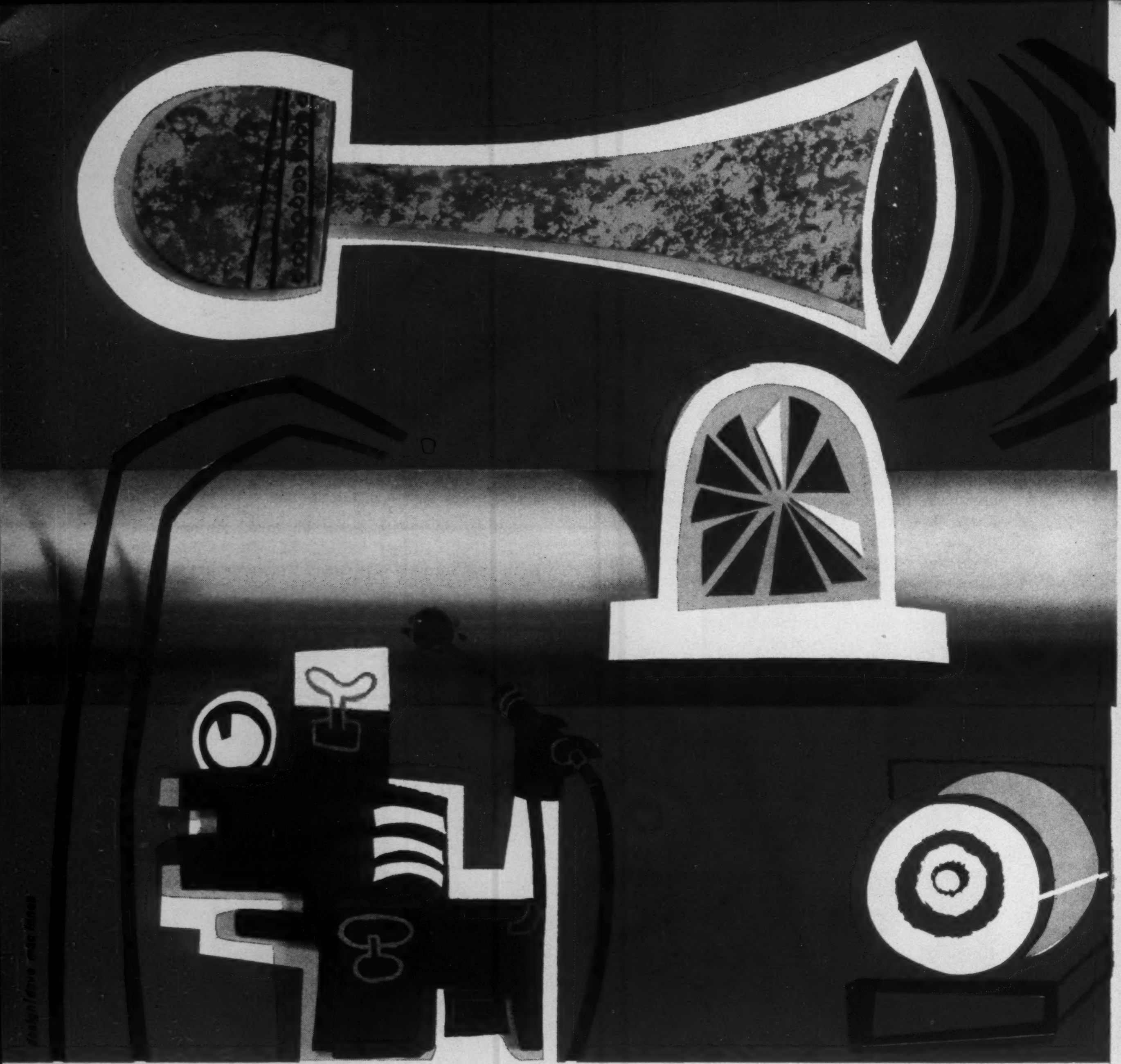
SELAS

HEAT AND FLUID PROCESSING ENGINEERS

DEVELOPMENT
•
DESIGN
•
CONSTRUCTION

SEE US
AT
THE
Iron & Steel
EXPOSITION
SEPT. 27, 28, 29, 30
CLEVELAND, OHIO

GRADIATION is a registered trade name of Selas Corporation of America



Lights, camera, action

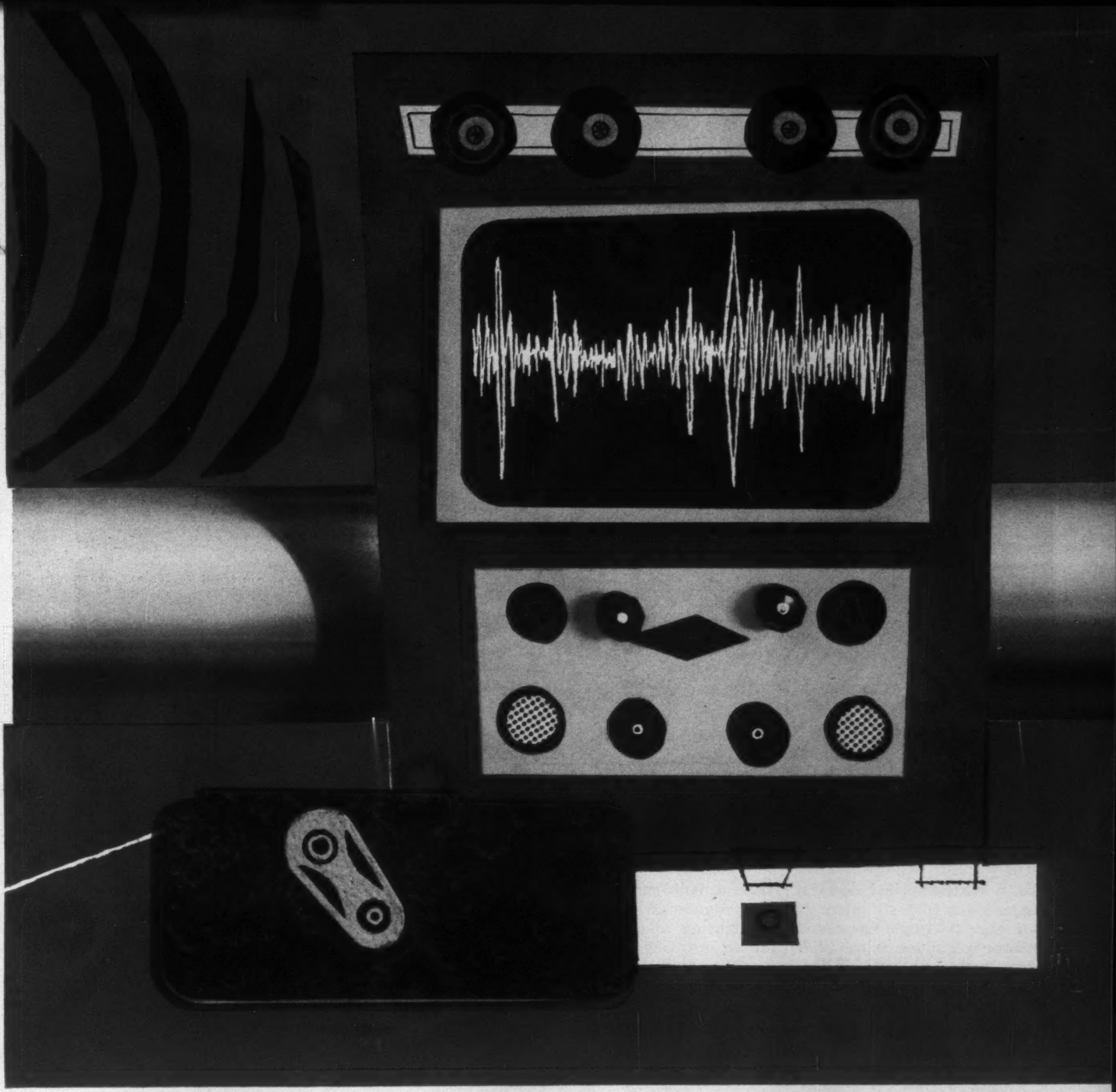
National Tube tests USS National Electric-Resistance Welded Pressure Tubing with sound waves. This ultrasonic weld inspection process is tougher than a Hollywood screen test.

Steel This mark tells you a product is made of modern Steel.

As the tubing slides directly over a ground quartz crystal, electrical pulses are focused on the weld area. The crystal changes these pulses into ultrasonic vibrations which bounce off the weld and reflect its strength or weakness. The vibrations are speared by the crystal, converted back into electrical energy, and floated across an oscilloscope screen.

If a bad weld is reflected, the electrical current dances wildly on the screen and triggers an alarm system. The crooked pattern is pen-recorded on a graph, a bullfrog-voiced horn croaks loudly, and the tubing is squirted with black paint to mark the defect.

In case the ultrasonic unit breaks down, a red-faced dome



light automatically flashes, revolves and winks at the weld inspector. This blushing signal tells him that the unit needs to be repaired. It's added insurance that every length of tubing is completely tested before it leaves the plant.

Our inspection techniques are rigid. But they help us develop a high quality product for use in applications such as boilers, heat exchangers, condensers, superheaters, economizers and other types of heat transfer equipment. Consider USS National Electric-Welded Tubing for your next installation. Our trained Mill Service Force is available for field consultation. Write National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. *USS and National are registered trademarks*

USS

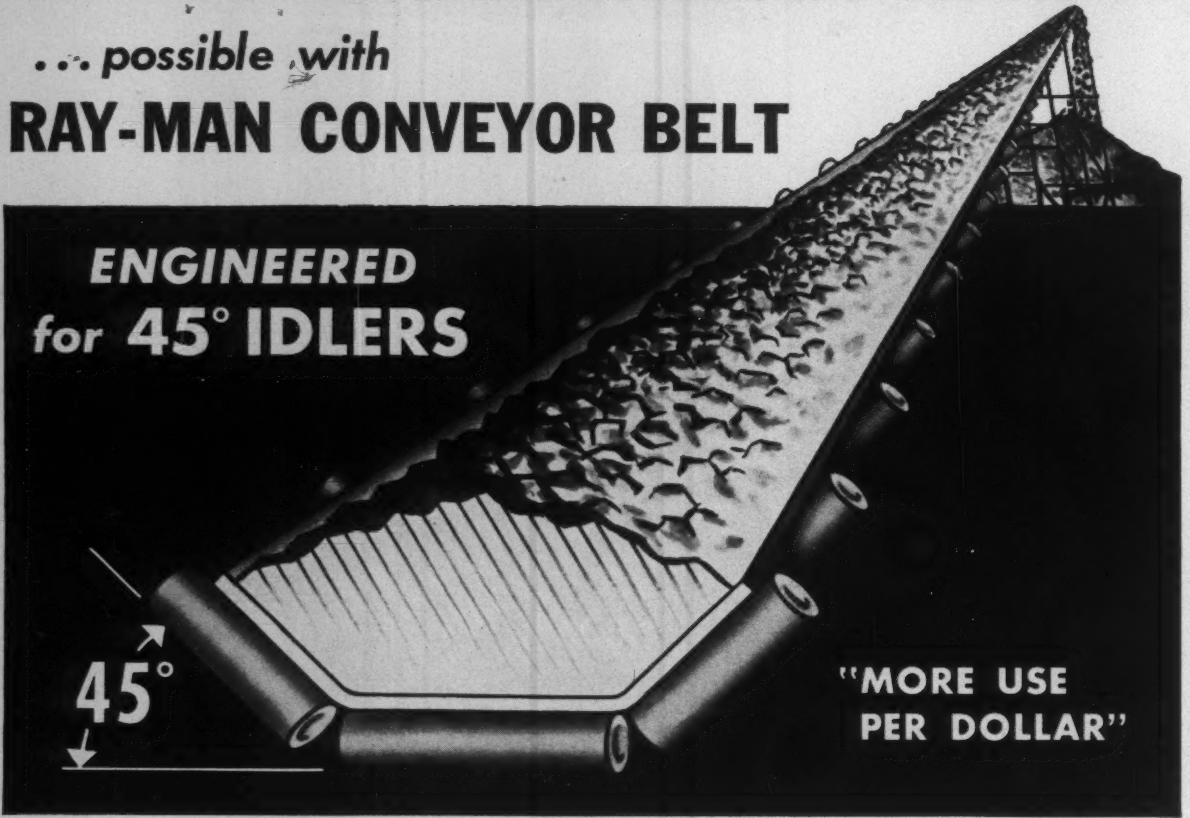
National Tube
Division of
United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York
United States Steel Supply Division

SAVINGS up to 20% on CONVEYOR COSTS
12 to 60% GREATER HAULING CAPACITY

. . . possible with

RAY-MAN CONVEYOR BELT

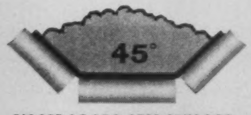


It's a mathematical certainty that a belt can haul bigger loads with 45° idlers than with regular 20° idlers. But the 45° angle between concentrating idlers and bottom roll idlers is too sharp for an ordinary heavy duty conveyor belt. Plies separate, but modern RAY-MAN CONVEYOR BELT licks this problem . . . for all time!

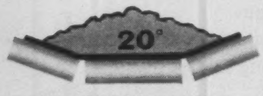
Ray-Man's exclusive flexible construction and built-in stress compensation are guaranteed to take the sharp angle of 45° idlers without ply or cover separation at the hinge line. This opens a whole new era of conveyor design . . . permitting larger loads . . . narrower conveyors . . . assuring longer cover wear . . . lower handling costs!

Ask your R/M representative to show you how Ray-Man Conveyor Belt with 45° idlers can give you the most for your conveyor dollar . . . write for new Bulletin M303, "Ray-Man for 45° Idlers."

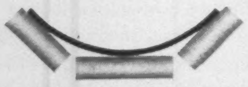
RAY-MAN BELT IS BUILT TO TAKE THE EXTRA STRESS OF 45° IDLERS



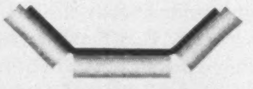
BIGGER LOADS, LESS SPILLAGE, LESS WEAR ON COVER WITH 45° IDLERS



20° IDLERS REQUIRE WIDER CONVEYOR TO HAUL SAME TONNAGE



ORDINARY PLY BELTS ARE TOO BOARDY TO TAKE 45° IDLERS



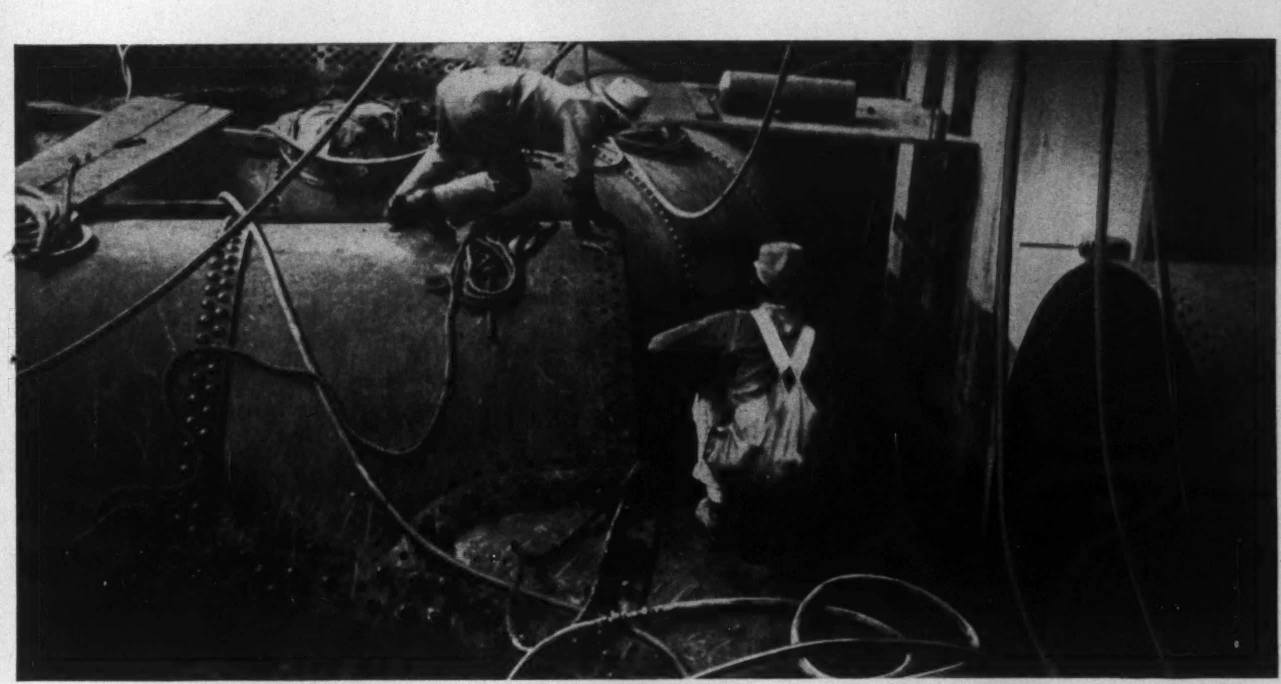
RAY-MAN IS GUARANTEED NOT TO PLY-SEPARATE AT 45° ANGLES

RAYBESTOS-MANHATTAN, INC.

MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY

R/M

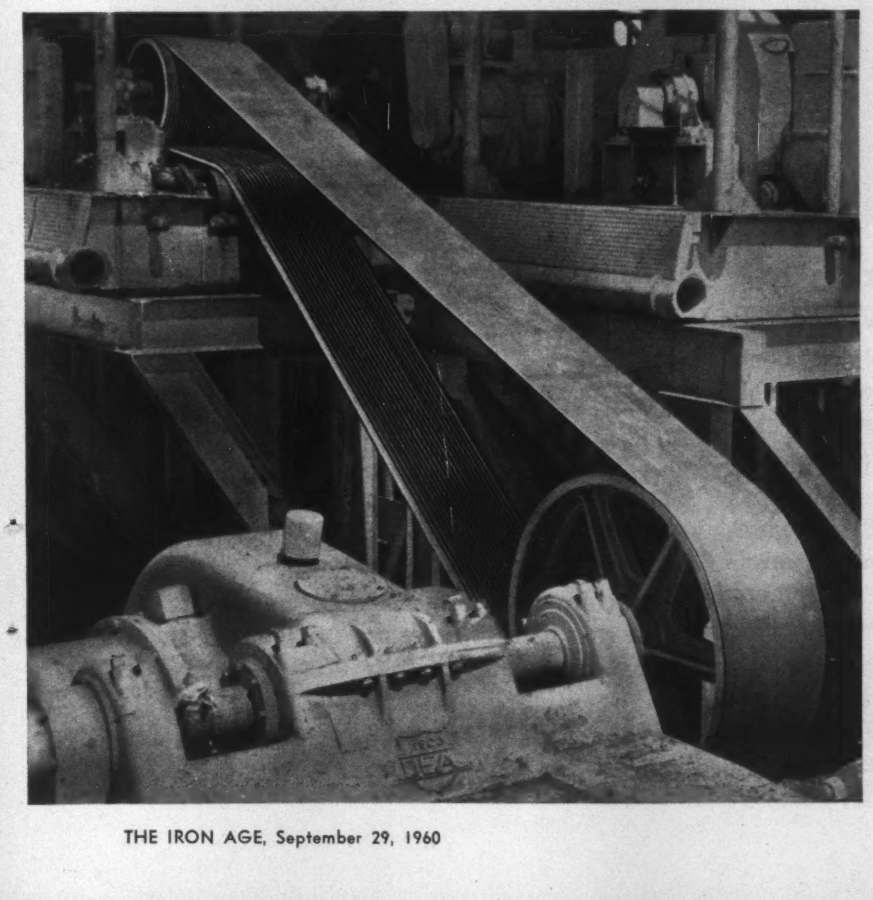
ENGINEERED
RUBBER
PRODUCTS
..."MORE USE
PER DOLLAR"



HOMOFLEX HOSE IS MORE FLEXIBLE, WEIGHS LESS THAN ANY HOSE FOR EQUAL PRESSURE

- FLEXIBLE AS A ROPE
- SUPER-STRONG
- NO PRE-SET TWIST—WILL NOT KINK
- UNIFORM INSIDE & OUTSIDE DIAMETERS
- INSEPARABLE TUBE-TO-COVER BOND
- EASIER, SAFER COUPLING
- FASTER, FULLER FLOW
- "MORE USE PER DOLLAR"

Let your R/M Distributor show you the advantages of Homoflex for air, water, other fluid and gases; also other types of R/M rubber hose for your job applications. Write for Bulletins M610 and M694.



CONVERT TO R/M POLY-V® DRIVE FOR MORE POWER IN LESS SPACE... *with Reliability*

- SINGLE UNIT V-RIBBED DESIGN—flat belts are also single units
- ELIMINATES BELT "MATCHING" PROBLEMS
- MAINTAINS GROOVE SHAPE
- CONSTANT PITCH AND SPEED RATIOS
- LESS WEAR ON BELT AND SHEAVES
- COMPLETE CONTACT-PRESSURE

Just two Poly-V belt cross sections meet every heavy duty power transmission requirement.

R/M Poly-V* Drive is the smoothest and coolest running —*longest wearing* drive you can install. Discuss your application with an R/M Distributor . . . or write for Poly-V* Drive Bulletin M141.

**Poly-V is patented by Raybestos-Manhattan, Inc.*

RM-1031

Greater visibility, trimmer lines for the new CHEVROLET, thanks to GAS! This is Libbey-Owens-Ford, where the new panoramic windshields are made for your beautiful new Chevrolet.

The forming of the curved glass is done in a limited temperature range at which glass can be bent without distortion. The production process challenged heat process engineers to design new automatic equipment capable of mass producing these large precision glass pieces.

LOF engineers, working with General Motors, discovered that Gas could produce the proper time-temperature cycle demanded by this process...efficiently, quickly, reliably.

The flat glass is conveyed under radiant Gas burners which bring the glass quickly up to bending temperature and allow the shaping of windshields, with reproducible uniformity, at high production rates.

The production of the Vista Panoramic windshield is another example of the contributions modern Gas equipment is making to American manufacturing. If your operation includes precise process heating, call your Gas company's industrial specialist and see how you can improve production with modern Gas equipment. **AMERICAN GAS ASSOCIATION**

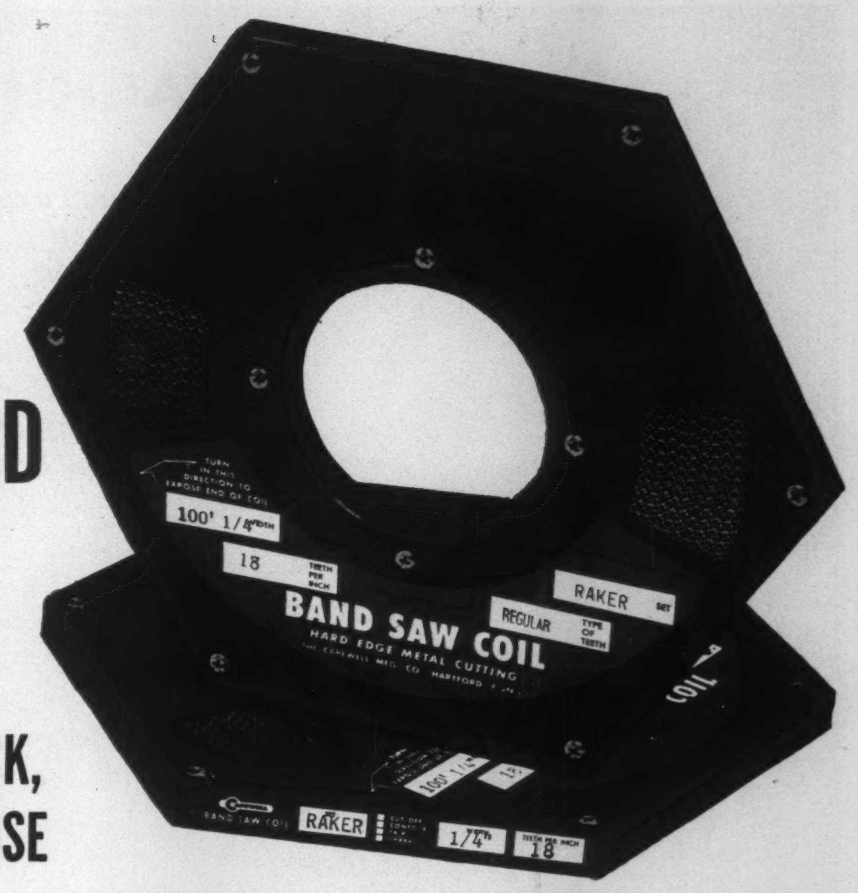
FOR PROCESS HEATING GAS IS GOOD BUSINESS

NEW

CAPEWELL

COILGUARD

band saw dispenser


TURN IN THIS DIRECTION TO EXPOSE END OF COIL
100' 1/4" WIDTH
18 TEETH PER INCH
RAKER SET
REGULAR TYPE OF TEETH
BAND SAW COIL
HARD EDGE METAL CUTTING
THE CAPEWELL MFG. CO. HARTFORD
COIL
BAND SAW COIL
RAKER
100' 1/4"
1/4" WIDTH
TEETH PER INCH 18

EASIER TO STOCK, IDENTIFY AND USE

★ Coilguard is designed and engineered to guarantee smooth easy dispensing and recoiling. Cut end does not protrude.

★ Coilguard's high impact plastic protects band saws in transit and in the warehouse. Two-way labeling permits identification when stacked vertically or flat.

★ Special nesting pins allow "shoulder to shoulder" stocking. Hex shape prevents rolling.

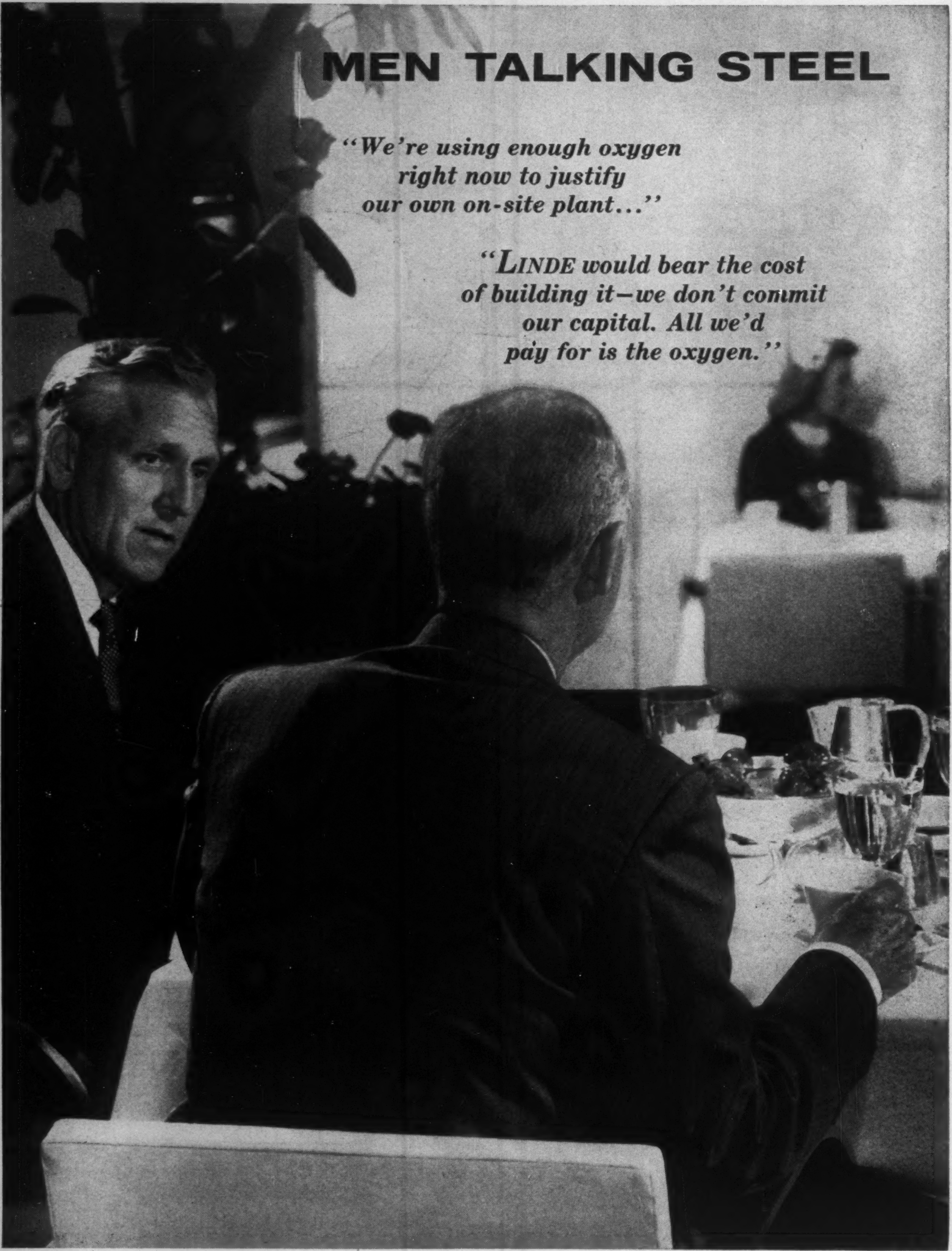
★ Through center hole facilitates handling, is ideal for mounting on pegs or pipes for dispensing.

Only Capewell Distributors carry bandsaws in the convenient Coilguard package. One more reason why your Capewell Distributor should be your source for all the saws you need—hand hack saws, power hack saws, band saws and hole saws.

INDUSTRIAL DISTRIBUTORS
SERVING INDUSTRY ECONOMICALLY
THE RIGHT HAND OF PRODUCTION

1881 CAPEWELL

THE CAPEWELL MFG. CO., HARTFORD 2, CONN.

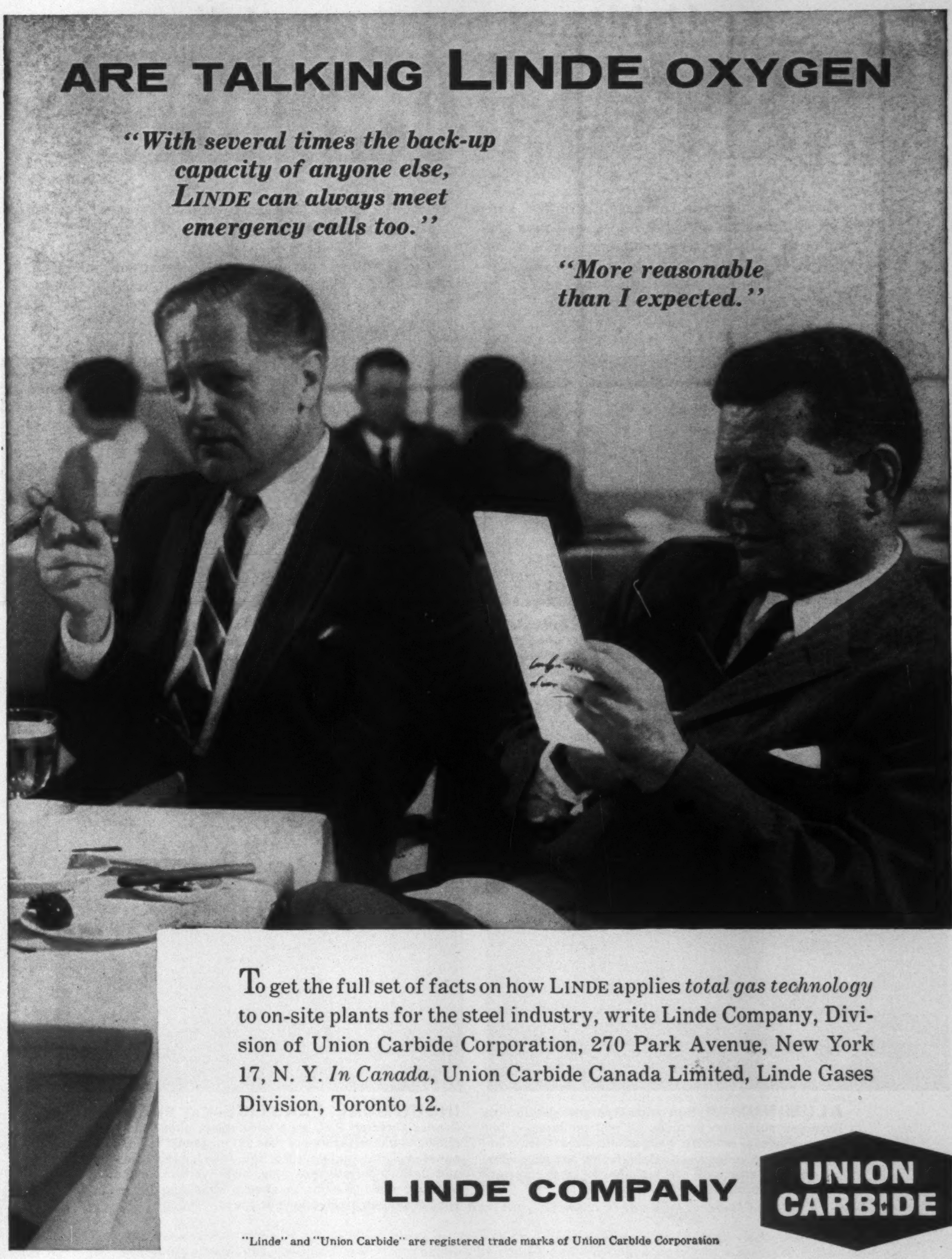


MEN TALKING STEEL

*"We're using enough oxygen
right now to justify
our own on-site plant..."*

*"LINDE would bear the cost
of building it—we don't commit
our capital. All we'd
pay for is the oxygen."*

ARE TALKING LINDE OXYGEN


"With several times the back-up capacity of anyone else, LINDE can always meet emergency calls too."
"More reasonable than I expected."

To get the full set of facts on how LINDE applies *total gas technology* to on-site plants for the steel industry, write Linde Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. *In Canada*, Union Carbide Canada Limited, Linde Gases Division, Toronto 12.

LINDE COMPANY

UNION CARBIDE

"Linde" and "Union Carbide" are registered trade marks of Union Carbide Corporation

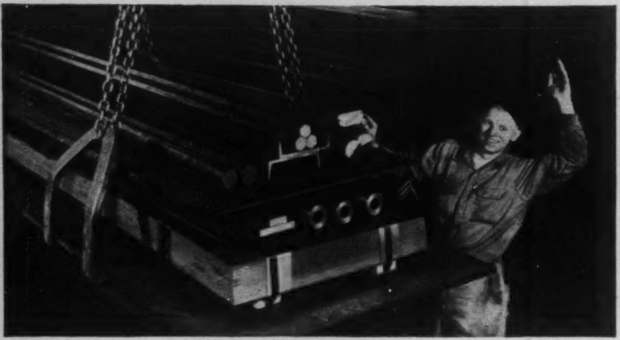
Unbiased recommendations . . .

STEEL . . . ALUMINUM . . .

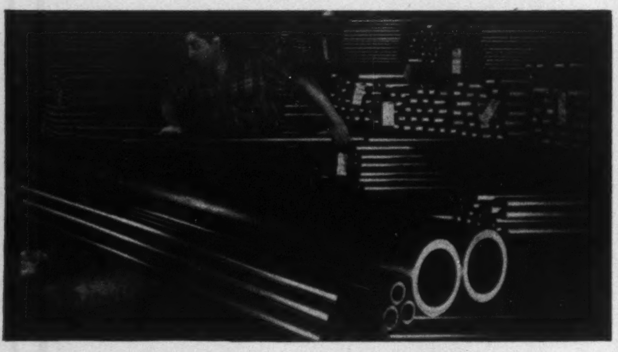
Because Ryerson is the nation's largest supplier of steel in all types and sizes—*plus* aluminum, plastics and machinery—you're assured of *unbiased* recommendations on materials and metal-fabricating machines to do your job best at lowest cost.

And along with the size and diversification of stocks comes this unsurpassed service: certified quality, on-time delivery, top technical help, 117 years of integrity.

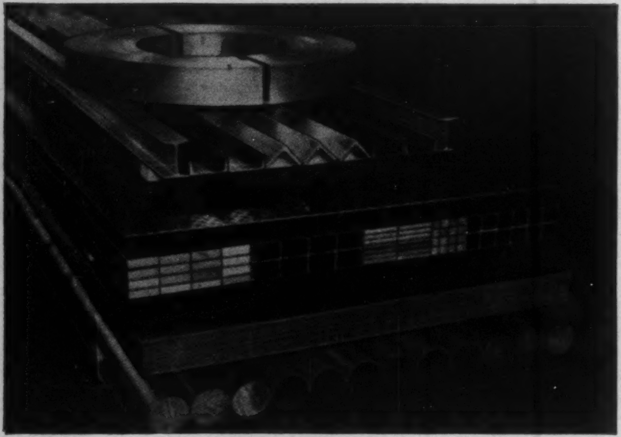
Put it all together and you have Metalogics—the Ryerson science of giving optimum value for every purchasing dollar. Ask your Ryerson representative for details.



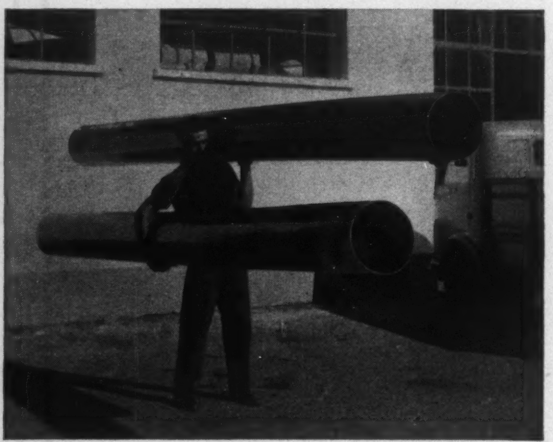
CARBON STEEL—No one even comes close to the size and diversity of Ryerson stocks of hot rolled carbon steel. All bars, structurals and plates are of known analysis or physical properties. Widely acclaimed accuracy of Ryerson sawing, shearing and flame-cutting is assured by published tolerances that are the most exacting in the industry.



TUBING AND COLD FINISHED BARS—Here again, Ryerson stocks are by far the nation's largest—including seamless and welded mechanical tubing; hydraulic cylinder and fluid line tubing; structural tubing; new Ledloy® 170 tubing, etc. And in cold finished bars—shafting, machinery steel, accuracy stock and screw stock, including fast-machining Ledloy 375 & 300.



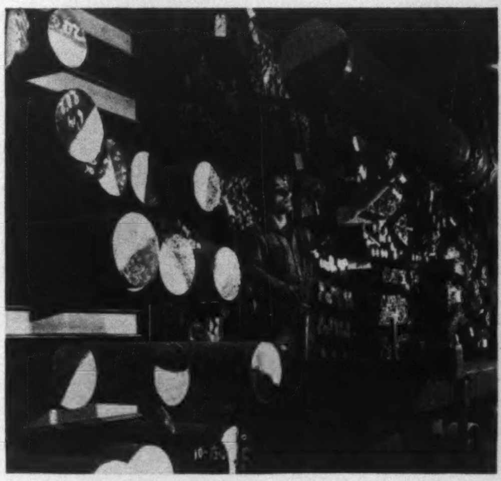
ALUMINUM—Nation-wide Ryerson service on Reynolds aluminum includes all mill products—a full range of alloys, tempers, gauges and sizes. Stocks include: flat and coiled sheet; plate; tubing and pipe; wire, rod and bar; structural and extruded shapes; commercial building products and related items.



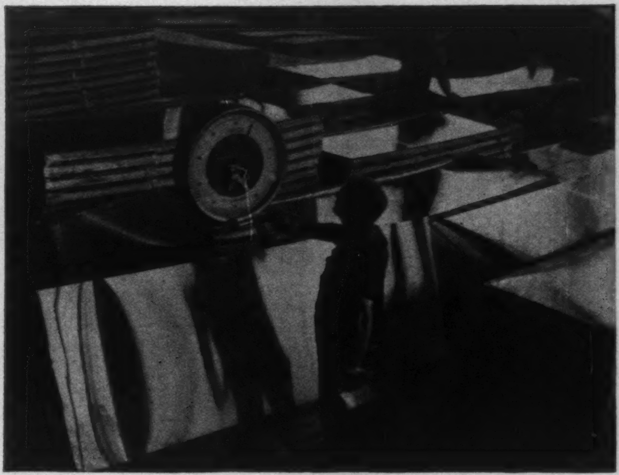
INDUSTRIAL PLASTICS—Call Ryerson for Ryertex-Omicron PVC pipe and tubing, sheet and rod: plastic that conquers more than 281 corrosive liquids and gases—will not weather, rot or age. Also for rigid Kralastic and flexible polyethylene pipe, and Ryertex® laminated phenolic resin plastics in sheets, rods and tubes . . . special shapes molded to your specs.

unequaled service on

PLASTICS...MACHINERY



ALLOY STEEL—Ryerson developed and perfected a plan to assure risk-proof alloys through an 8-Step Certified Quality Program—and leads the industry in size and diversification of stocks, including case-hardening, direct-hardening and heat-treated alloys; leaded alloys, including Rycut® steels (fastest-machining in their carbon ranges); aircraft quality alloys, etc.



STAINLESS STEEL—2351 sizes, shapes, types and finishes of stainless in Ryerson stocks. All certified to meet ASTM, SAE, Military, DuPont or G.E. specifications—assuring close control over chemical composition and mechanical properties. Call us for all your requirements on stainless sheets, plates, bars, pipe and fittings and tubing, heads and machine-cut rings and discs. Cutting facilities include latest Heliarc equipment.

METALWORKING MACHINERY—More than 3800 types and models of machinery and tools produced by nearly 100 of the nation's leading manufacturers are available through the Ryerson Machinery Division. The broadest line available from a single source includes equipment for bending, braking, forming, hoisting, drilling, pressing, punching, rolling, sawing, shearing, threading, welding. Also, material handling equipment.

SHEET AND STRIP STEEL—More than 20 kinds. Hot rolled, cold rolled and pickled and oiled—tight-coated galvanized and galvannealed—Ryex® expanded metal, perforated sheets, etc. Latest shears, slitters, and cut-to-length lines enable us to give fast delivery on every requirement.

METALOGICS
RYERSON PLUS VALUES

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

RYERSON STEEL®

Joseph T. Ryerson & Son, Inc., Member of the INLAND® Steel Family

SERVICE CENTER PLANTS: BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT • HOUSTON • INDIANAPOLIS LOS ANGELES • MILWAUKEE • NEW YORK • PHILADELPHIA • PITTSBURGH • ST. LOUIS • SAN FRANCISCO • SEATTLE • SPOKANE • WALLINGFORD

0 1.3 9 8
HEAD
GRAY
0 1 0.1 1 2
COLUMN
GRAY

GRAY was the first to recognize the unparalleled advantages of the Norden System of Numerical Control when applied to a Gray Horizontal Milling and Boring Machine or a Planer Type Milling Machine.

Gray was the first to introduce this superior control that was jointly developed by Gray and Norden.

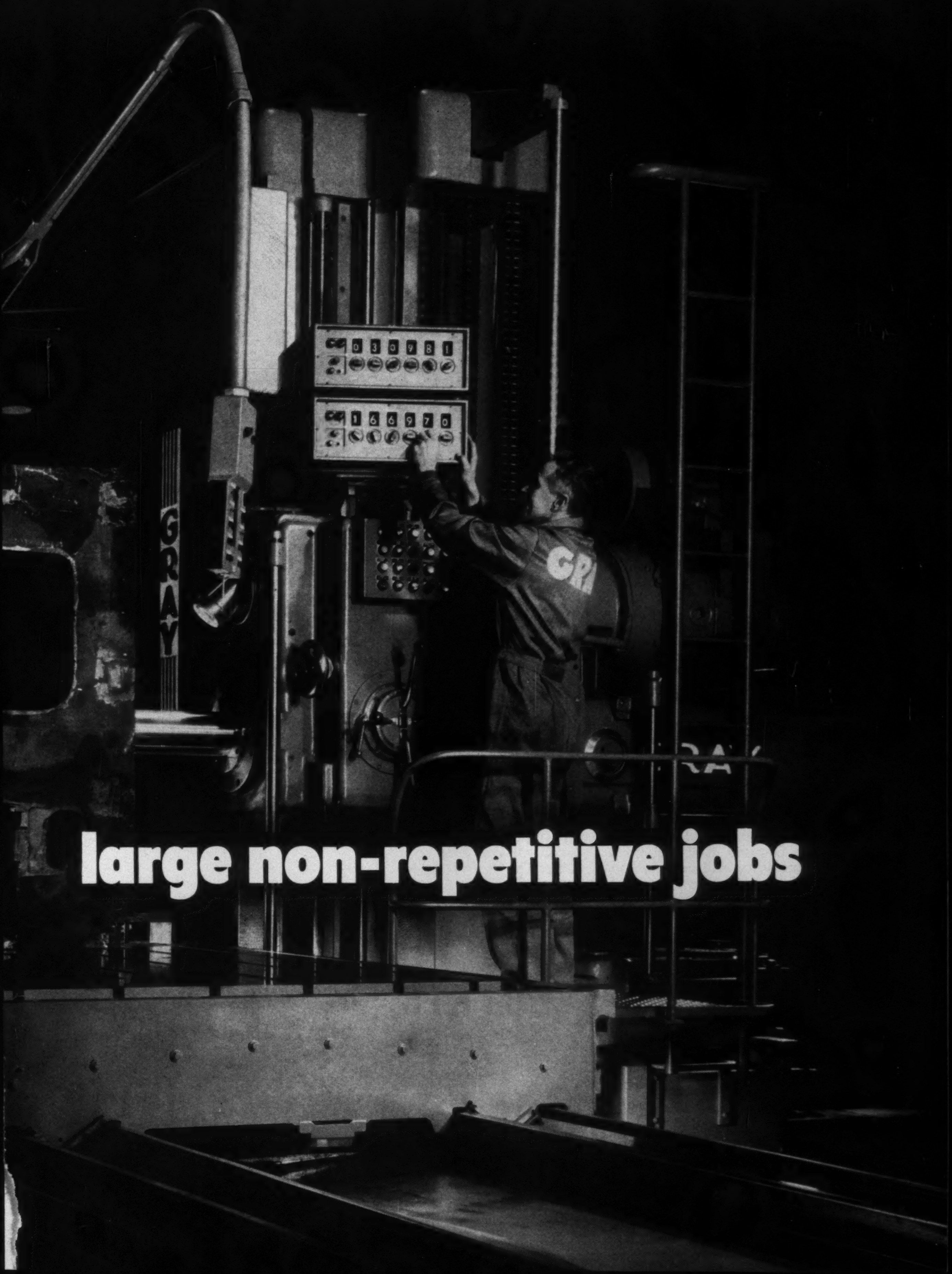
Consider these salient features:

- Read-out. A visual display clearly indicating at all times the exact location of a machine tool element.
- Zero Off-set. Ability to establish zero read-out on the display at any predetermined reference point on the work piece. Operator then reads drawing dimensions on display unit.
- Work to closer accuracies. Overall accuracies within .001". Unaffected by line voltage.
- Greatest productivity over prolonged period. Replaceable modular construction facilities quick servicing.
- Progressive steps to full tape control. Each phase may be purchased individually.

The G. A. GRAY Co. Cincinnati, Ohio

Horizontal Milling and Boring Machines
Planers • Planer Type Milling Machines

the perfect combination for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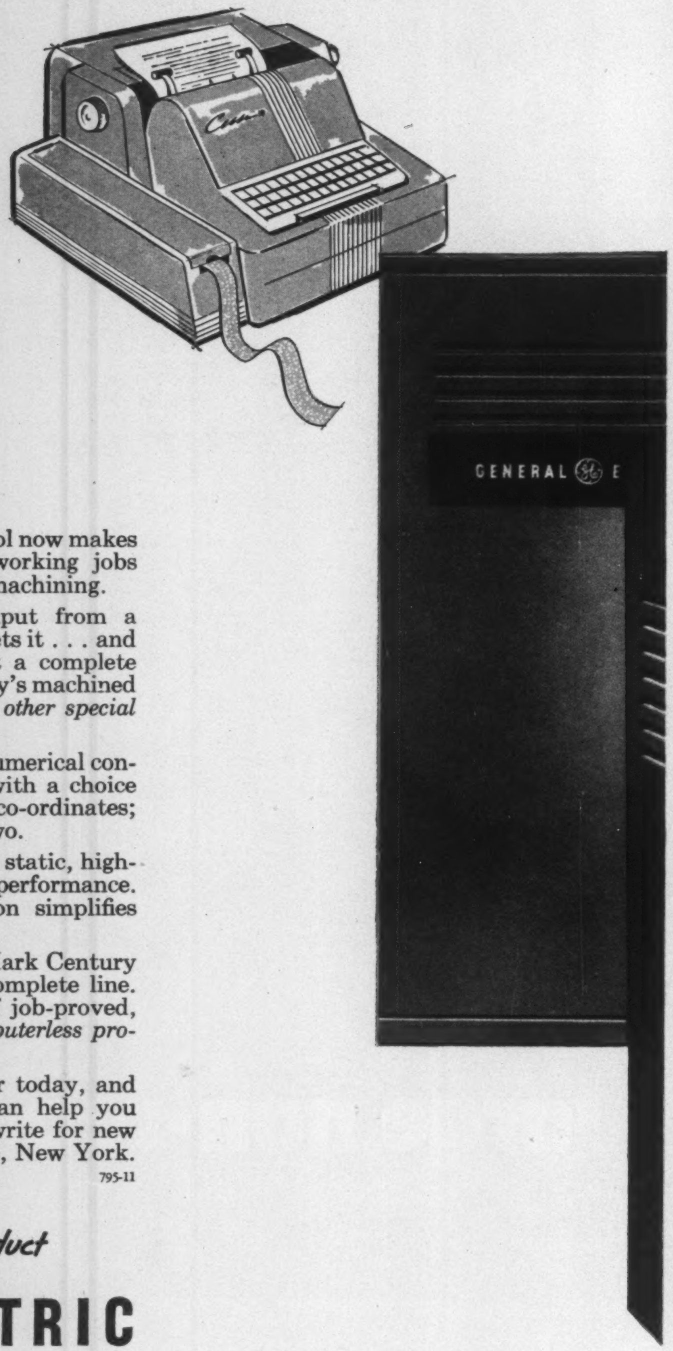
GRAY
GRA
large non-repetitive jobs

NOW...

automatic contouring **without** a computer



New General Electric Mark Century numerical control now makes *computerless programming* a reality for most metalworking jobs . . . including all circular, angular, and straight-line machining.

This new control system takes punched-tape input from a standard automatic typewriter . . . reads and interprets it . . . and automatically commands the machine to carry out a complete machining cycle. Producing more than 85% of industry's machined parts can be as simple as that—*with no computer or other special equipment necessary!*

Contouring or absolute positioning—Mark Century numerical control comes in a compact, "building-block" package with a choice of: 1-, 2-, 3-, 4-, or 5-motion positioning to absolute co-ordinates; 2- or 3-motion contouring; or a combination of the two.

Solid-state devices, modular construction—Completely static, high-speed logic circuits mean long life and dependable performance. New General Electric plug-in, modular construction simplifies maintenance and inspection.

Another member of the G-E program control family—Mark Century control is the newest addition to General Electric's complete line. It supplements the industry-renowned Mark series of job-proved, low-cost numerical positioning control to bring *computerless programming* to America's metalworking industry.

See your machinery builder or G-E Sales Engineer today, and find out how General Electric numerical control can help you increase productivity and cut machining costs. Or, write for new bulletin to General Electric Company, Schenectady 5, New York. Specialty Control Dept., Waynesboro, Va. 795-11

Progress Is Our Most Important Product

GENERAL ELECTRIC

NEW MARK CENTURY

NUMERICAL CONTROL
FOR AUTOMATION

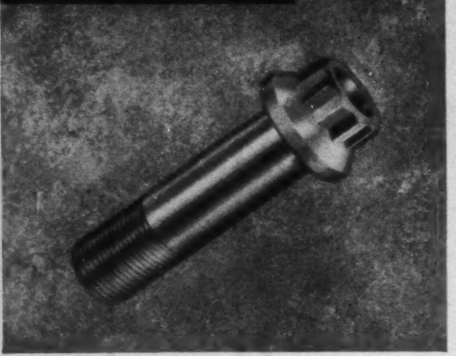
GENERAL ELECTRIC

NUMERICAL CONTROL

UNBRAKO

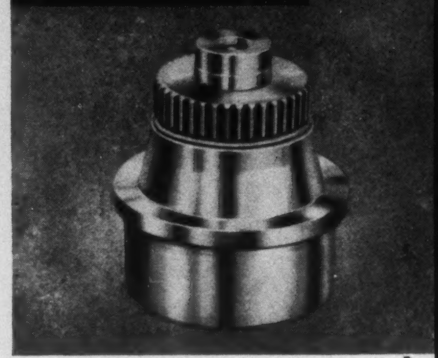
INDUSTRIAL FASTENERS like this Socket Head Cap Screw are produced to a dynamic reliability standard as a result of SPS research. The SPS line includes a limitless variety of self-locking screws, locknuts and precision fasteners for everything from massive machinery to the most minute products.

SPS AIRCRAFT



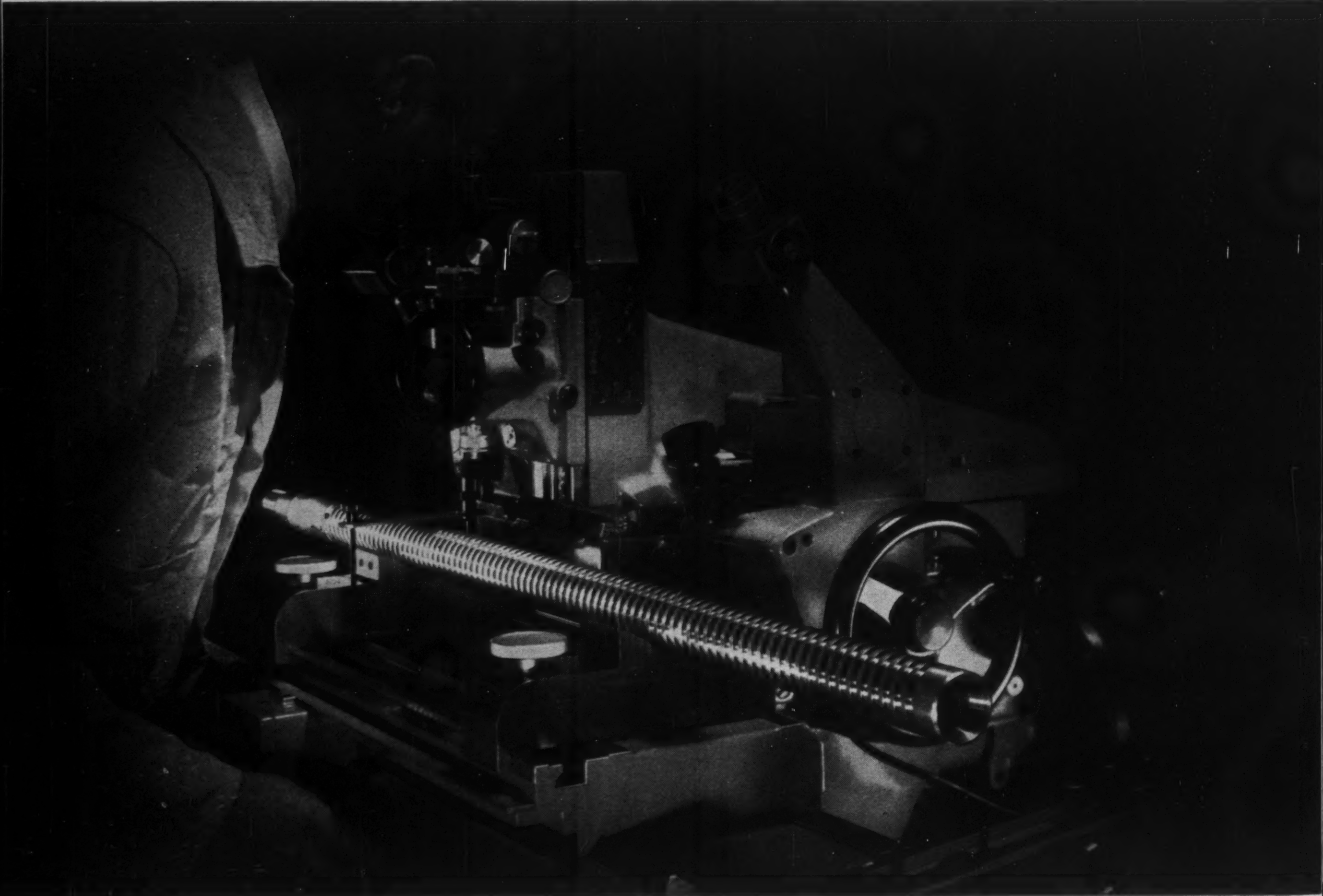
AIRCRAFT/MISSILE FASTENERS like this bolt are produced to ultra-high performance standards at SPS. Today's lightest, strongest fasteners in standard and special designs are products of SPS. Research and development work includes titanium, beryllium and other lightweight, high-strength exotic metals.

SPS NUCLEAR



NUCLEAR COMPONENTS like this cap for a core housing are held to almost unbelievable dimensional tolerances. The nuclear energy field depends on SPS for threaded fasteners, control rod drive mechanisms, motor tubes, core components, instrumentation housings and many other essential parts.

SPS metrology treats big parts

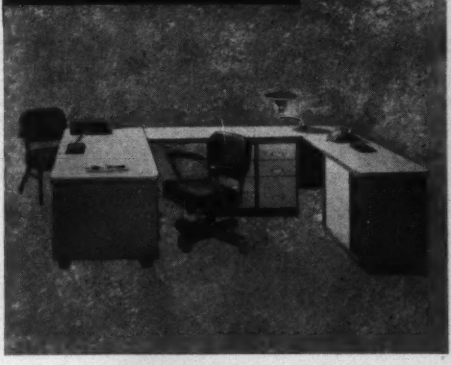


Universal machine in one of the SPS laboratories, measuring thread form and lead of screw for atomic reactor control mechanism. Optical system of this machine is capable of measurements to 10 millionths of an inch.

HALLOWELL

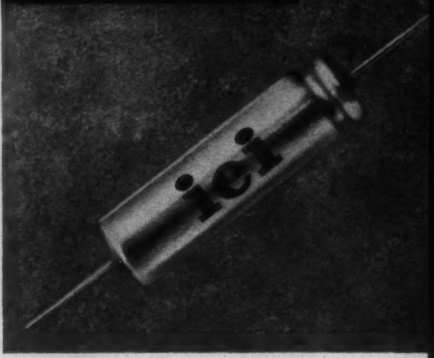
SHOP EQUIPMENT for industry and schools is made to the same superior quality standards as other SPS products. The Hallowell line offers broad coverage of standard and special needs in work benches, shelving, and similar equipment. Ruggedness and space efficiency are well identified with Hallowell.

COLUMBIA



OFFICE FURNITURE like this handsome Columbia Nine-to-Five unit sets an office apart with distinctive styling and color combinations. The complete line includes efficiently designed, durable steel office furniture, plus special units, a wide choice of smart chairs, filing cabinets and accessories.

I. E. I.



CAPACITORS FOR ELECTRONICS bearing the IEI trademark are widely used for subminiature circuitry and transistorized applications. This SPS company makes both aluminum and tantalum capacitors, including the lightest and smallest per given capacitance in the industry, to the highest quality standards.

with miniaturization care

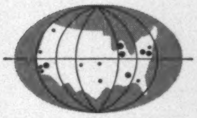
Advancing technology demands that big parts be as precise as miniature ones.

The nerve center of precision measurement at SPS is the Metrology Laboratory. Here, the miniature fastener and the large nuclear component alike undergo industry's most meticulous scrutiny. Often, measurements are as critical as 5 millionths of an inch.

SPS metrology is daily helping to raise accuracy standards for man's new frontiers in metal parts and threaded fasteners. The lab is responsible for the accuracy of $3 million worth of precision gaging throughout the international operation that is SPS today.

As a service to industry, SPS maintains three identical metrology labs—in Jenkintown, Pa., Cleveland, Ohio, and Santa Ana, Calif. At these centers, no thread fit problem is too large . . . or too small.

Want to know more about this reliability service? Write for the booklet, "SPS Screw Thread Metrology Laboratories".

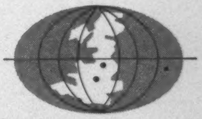


UNITED STATES

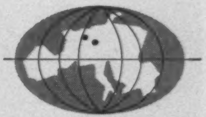
CANADA

SPS

where reliability replaces probability



GREAT BRITAIN



EUROPE

STANDARD PRESSED STEEL CO., Jenkintown, Pa., Santa Ana, Calif. • The Cleveland Cap Screw Company, Cleveland, O. • Columbia Steel Equipment Div., Fort Washington, Pa. • International Electronic Industries, Inc., Nashville, Tenn. • National Machine Products Div., Utica, Mich. • Standco Canada, Ltd., Toronto, Canada • Unbrako Socket Screw Co., Ltd., Coventry and Unbrako Steel Co., Limited, Sheffield, England • Unbrako Schrauben G.m.b.H., Dusseldorf and Koblenz, W. Germany.

AT HOME IN THE ATOMIC AGE...

Matter of fact, stainless steel is more at home in these demanding times than ever before. Rigid requirements in modern components—rather than restricting the use of stainless—have opened an even broader market for this versatile metal. Its remarkable durability and superior resistance to corrosion and heat make stainless all but indispensable in the construction and operation of atomic energy plants. Eastern is proud to have a share in this vital activity.

Eastern is the world's largest exclusive producer of stainless steel sheets and plates. Sold through steel service centers coast to coast.

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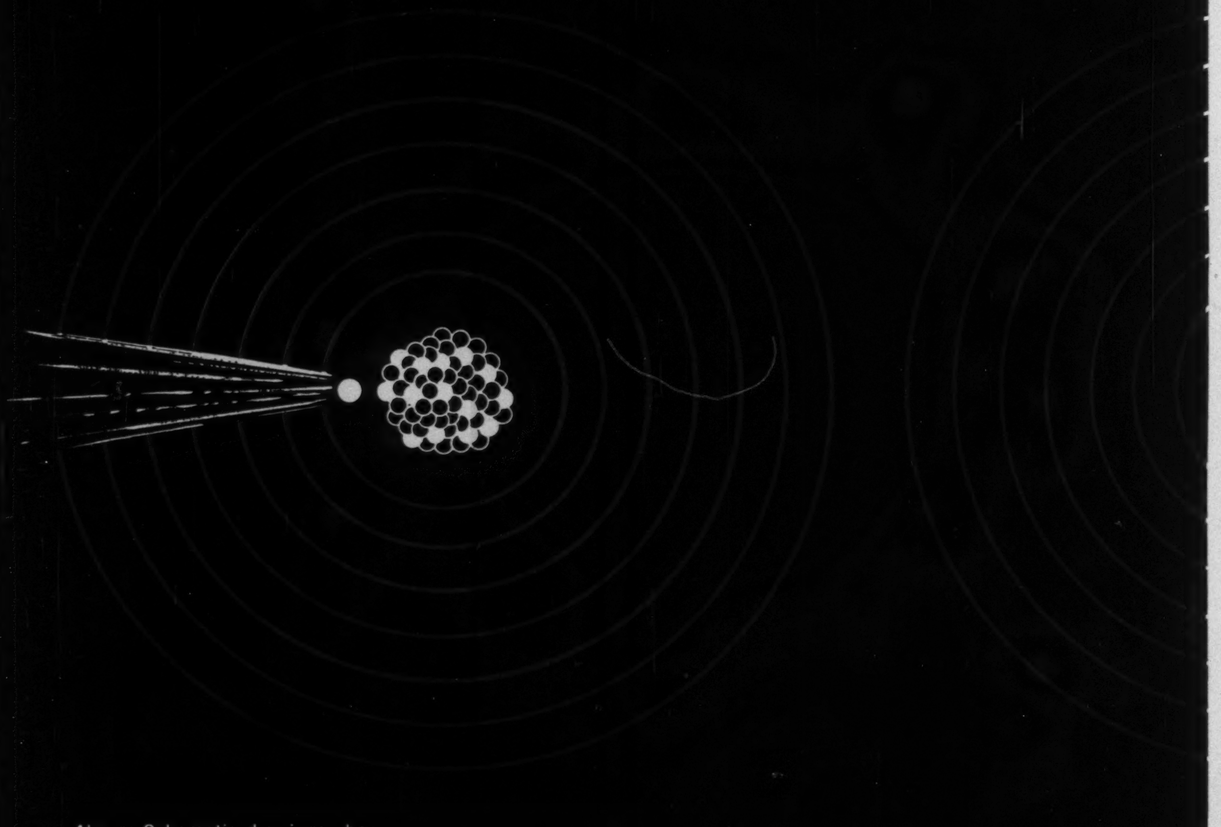
STAINLESS STEEL
BALTIMORE 3, MARYLAND, U.S.A.
Stainless steel sheets, plates, strip, coils



Above: Schematic drawings show how nuclear fission occurs. One atom becomes two, releasing energy.
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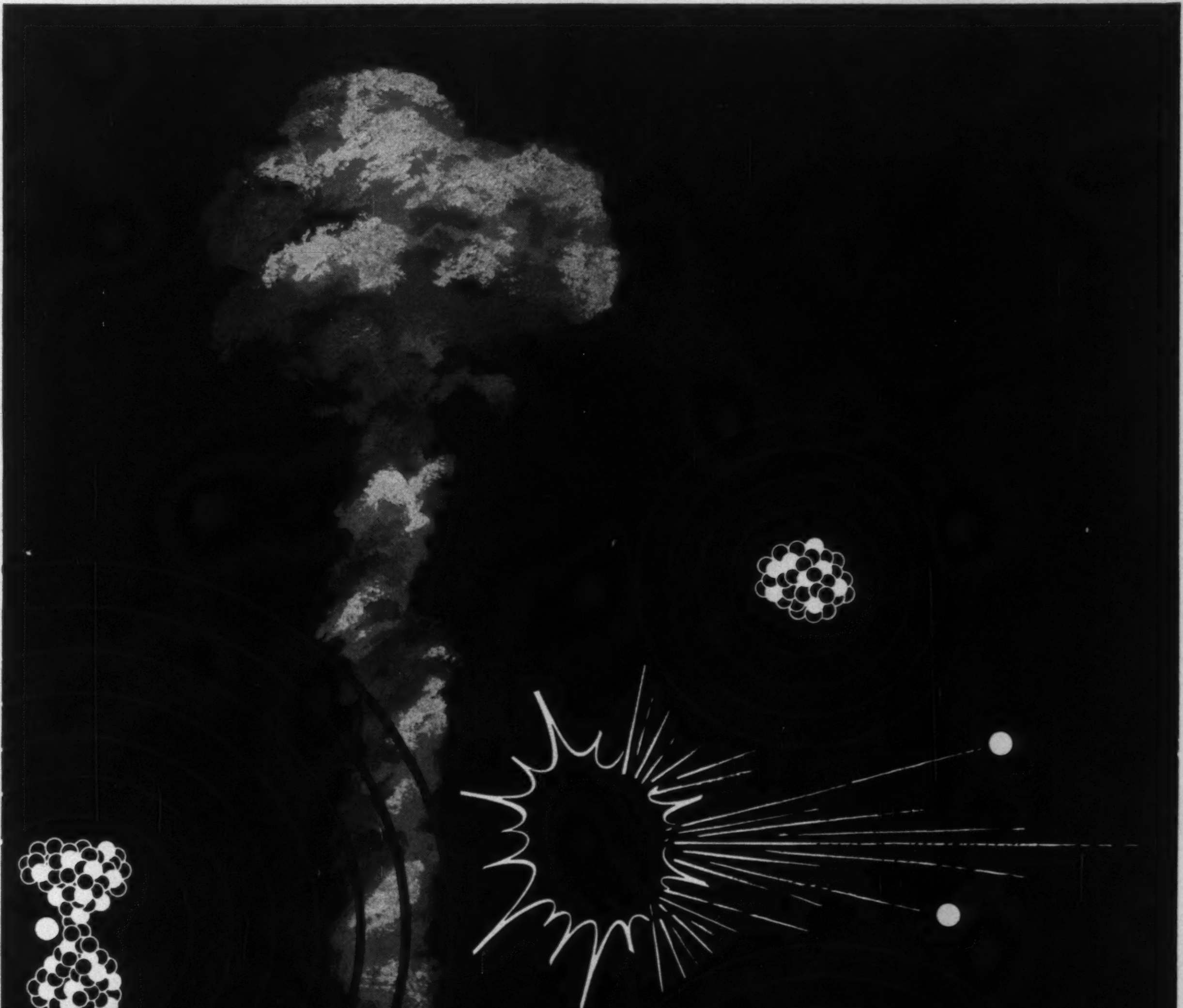
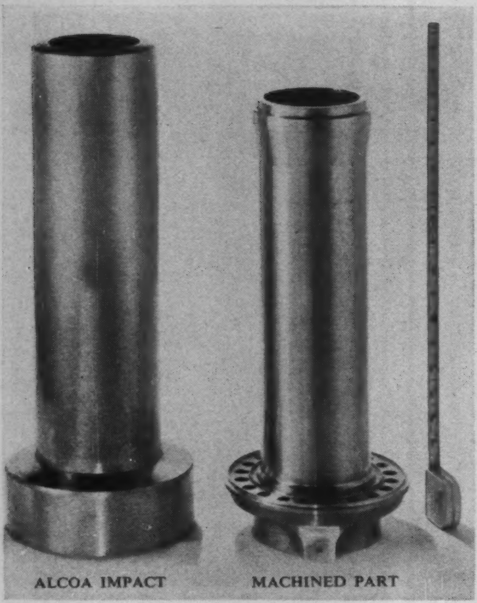
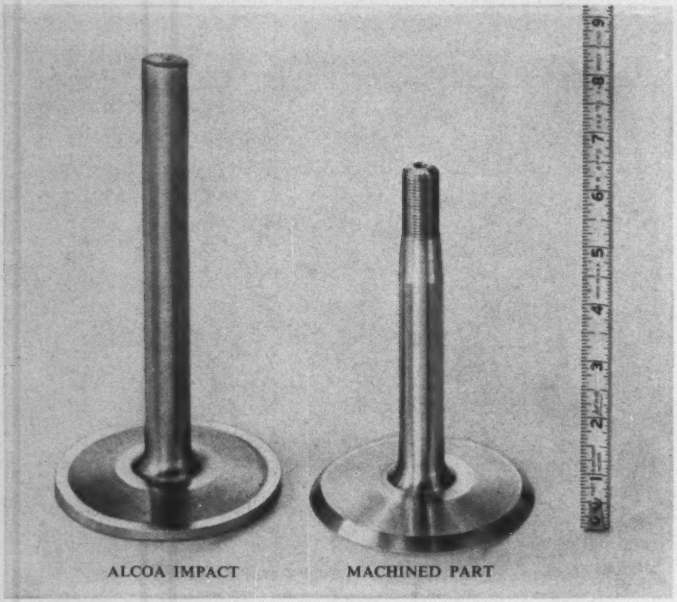


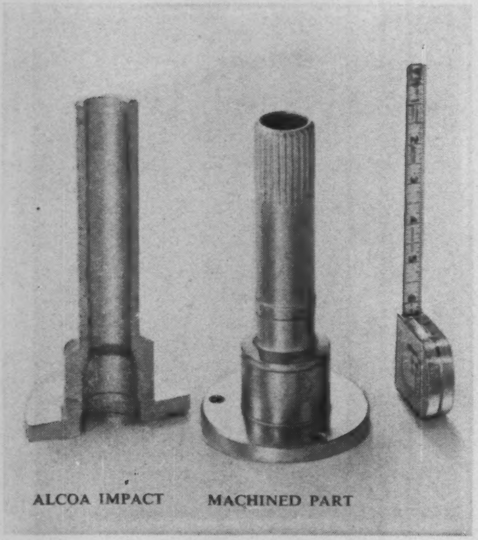

ALCOA IMPACT
MACHINED PART

Use of an impact for this missile component provides significant savings in machining time and material cost.

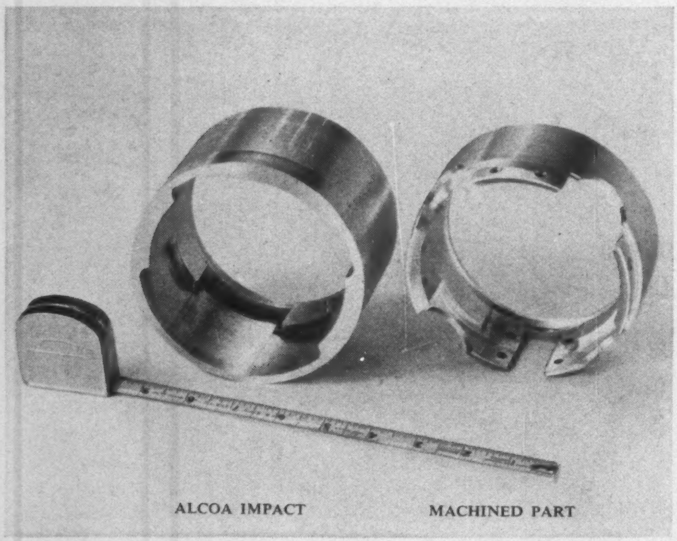

ALCOA IMPACT
MACHINED PART

Impact eliminates prohibitive waste of stock previously encountered in machining this air compressor valve from rod stock.

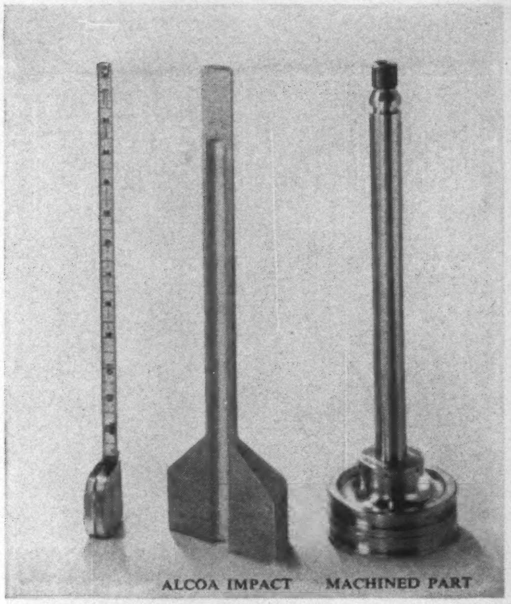
IN IMPACTS . . . Alcoa


ALCOA IMPACT
MACHINED PART

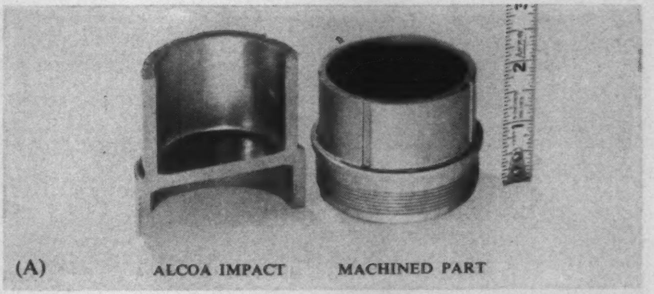
Impact replaces steel forging in which center hole had to be drilled. Cost of finished aluminum part is approximately half that of steel part.

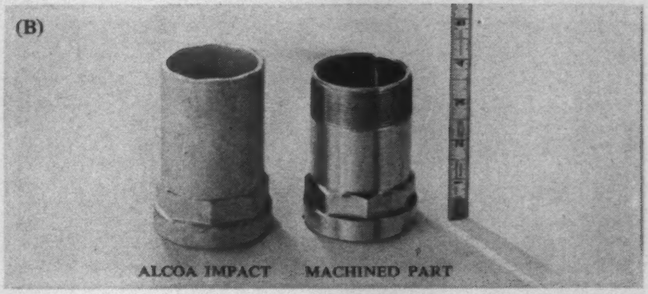

ALCOA IMPACT
MACHINED PART

Side-wall steps and grooves in the impact reduce hogging and milling operations in this missile component.



Impact's extremely precise center hole avoids costly deep drilling while impact's outside contour saves high machining chip loss.

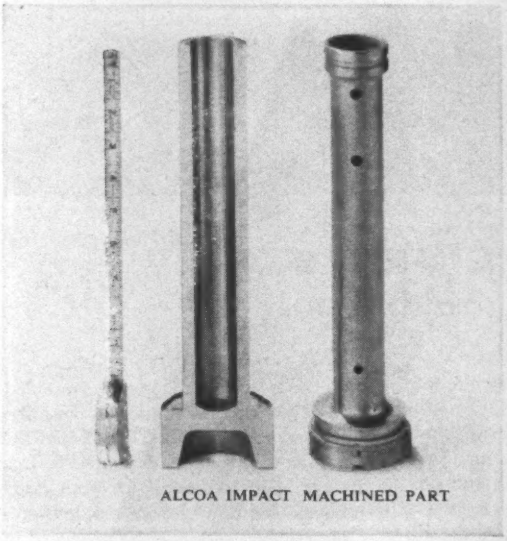




(A) Impact incorporates close-tolerance indexing grooves and keys on both ends. Saves precision milling operations and reduces machining time and costs.

(B) Impact reduces machining waste and milling of flats—unavoidable if this sleeve cable connector were machined from heavy wall tubing.

puts the metal where you want it



Impact banishes deep drilling and wasteful machining required when machining this aircraft landing gear plunger from solid stock.

. . . to save time, money and metal in machining blanks

Every impact on this page is produced quick as a wink. Every one is produced in a strong, heat-treatable alloy with good machining characteristics. Every one incorporates a costsaving design feature—a flange, step, groove, keyway, stem, rib, cavity or deep hole. Every one is made to close tolerances—as close as ±0.005 in.—without draft. Every one eliminates excessive machining waste and costly operations such as hogging, milling, broaching or deep drilling. Every one is visible proof that in impacts, Alcoa puts the metal where you want it.

The more you know about impacts, the more uses—and savings—you'll find in your own production. See for yourself. Write for *Metal in Motion*, Alcoa's new 34-page brochure on impacts. Aluminum Company of America, 907-J Alcoa Building, Pittsburgh 19, Pa.

Alcoa puts the metal where you want it—
in castings, forgings, extrusions, screw machine parts and impacts.

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

Visit the Alcoa Booth (No. 1410) at the National Metals Exposition in Philadelphia, October 17-21

OHIO RUBBER

"CUSTOMEERED COMPONENTS BASIC TO INDUSTRY"

STAINLESS STEEL JEWELS
make facsimiles by the million!

OHIO RUBBER can, and regularly does produce 100,000 *identical* rubber parts per day from one set of production tooling. The jewel-like precision of the self registering molds shown above—actual size—is a key factor in ORCO's high speed, high accuracy, continuous molding process.

AUTOMATIC INTEGRATION of processing steps which are usually handled separately eliminates variables—provides precise control for achieving the ultimate in product uniformity. RUBBER PARTS up to 1½" in diameter and 1" in thickness produced by this process are distinguished by uniformity, minimum flash and precision tolerance of ± .003".

QUANTITY REQUIREMENTS involving not less than 500,000 parts proves best for this new process.

"DO YOU use small precision molded rubber parts by the million?", if so, the full story of ORCO "CUSTOMEERED" Continuous Molding is yours via free Bulletin CM-100. Send for your copy today to see how custom molded, precision rubber parts can be produced in volume—at less cost. MP-160

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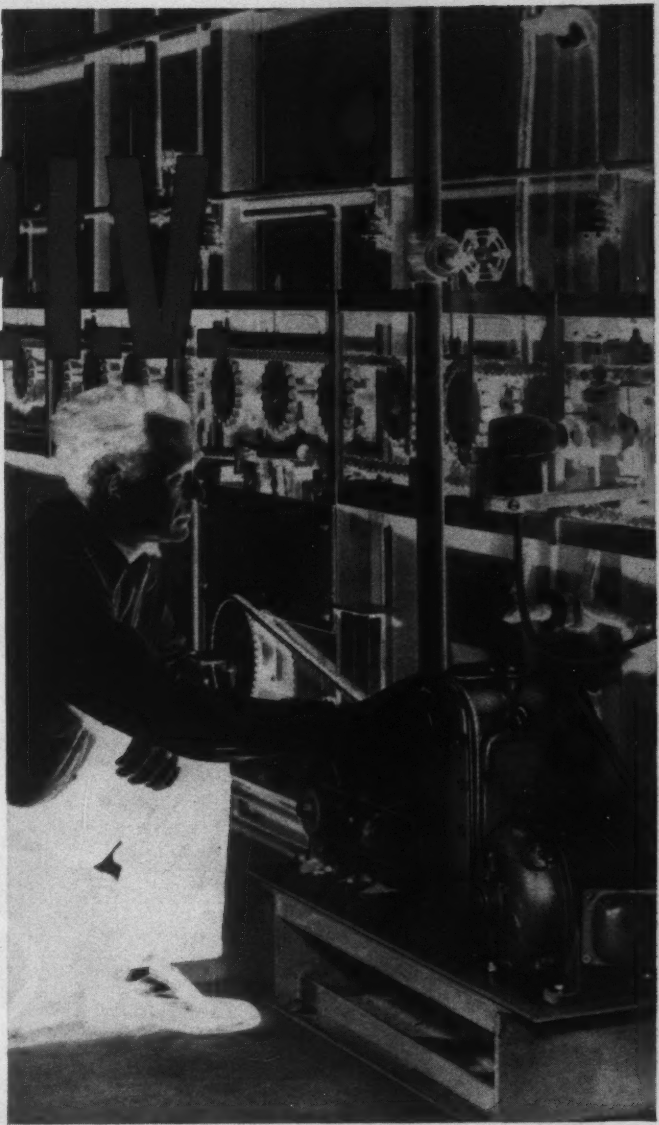
Most accurate of all mechanical variable speed drives:

positive P.I.V.

Infinitely Variable

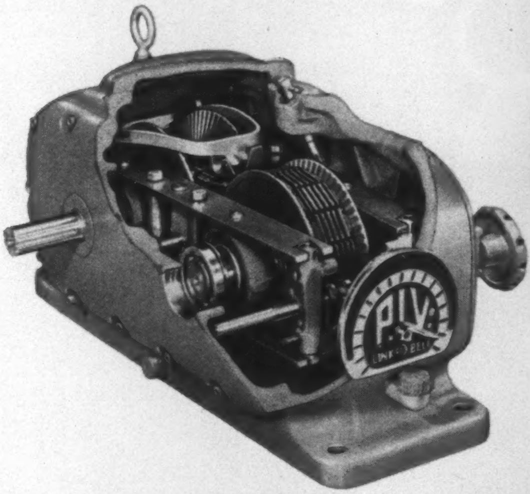


For stepless, slipless speed changing, there's nothing like Link-Belt P.I.V.—the *only* chain-driven variable speed drive.

With P.I.V., teeth—not tension—assure positive, high-efficiency power transmission. You can select any speed in its range—find it instantly, hold it indefinitely. The exclusive all-metal, self-tooth-forming chain meshes with radially grooved wheels . . . maintains positive, nonslip contact at any speed under all loads.

P.I.V. drives are fully enclosed . . . unaffected by atmospheric conditions. They're available in 8 sizes, 16 standard types, capacities from ½ to 25 hp. Type RS is available in capacities up to 50 hp.

For full details, ask your Link-Belt district sales office or authorized stock-carrying distributor for Book 2274. You'll find them in the yellow pages of your local phone directory under Power Transmission Equipment.



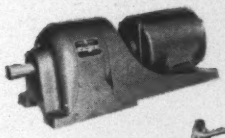
INSTANT SPEED CHANGING is achieved by simply turning handwheel to desired position on easy-to-read dial. P.I.V. drives are also available with electric, pneumatic or hydraulic controls. Here P.I.V. drive and Link-Belt roller chain accurately regulate speed of rolls in roller-hearth furnaces used to heat-treat jet engine parts.

LINK-BELT

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

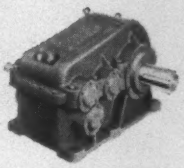
15,345

LINK-BELT has the right reducer for every need, every speed

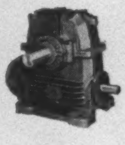


MOTOGEARS

SHAFT-MOUNTED

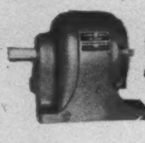


PARALLEL SHAFT

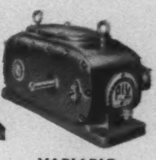


WORM

GEARMOTORS



IN-LINE



VARIABLE SPEED

A
B

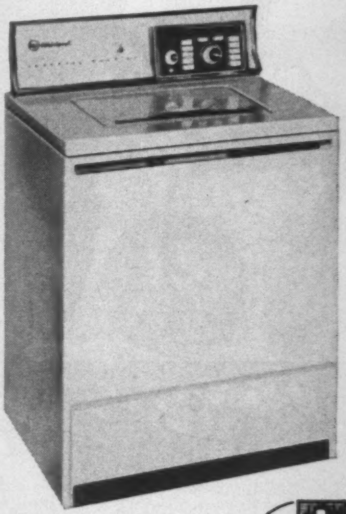
Republic Products form KEY COMPONENTS for RCA Whirlpool WASHING MACHINES

Design a washing machine with 11 automatic cycles . . . build in long-term dependability . . . keep prices competitive. The Whirlpool Corporation does it in their 1961 line of washers. Precision engineering is one part of the story . . . careful selection of materials and components (such as those illustrated here) is the other.

Republic's broad product lines and unique capabilities can help you build more quality into your products, too . . . often at a lower cost than the materials you're presently using. For more specific information, and for data on the Republic design, engineering and metallurgical services available to you, mail the coupon.

A. MECHANICAL TUBING—Washing machine center posts are made from 1¾ O.D. Republic ELECTRUNITE® Mechanical Tubing. Its true concentricity and high uniformity eliminate finishing costs. No rejects or wasted material. Just two simple steps (counter boring and pressing in bushing) and the mechanical tubing component is ready for installation. Mail the coupon for more information on Republic ELECTRUNITE Mechanical Tubing.

B. HOT ROLLED BARS—Suspension rods that carry the weight of the entire operating mechanism and anchor the unit to the washer cabinet, are fabricated from 7/16-inch Hot Rolled Carbon Bars from Republic's new 11-inch mill. Strength and uniform quality are important considerations. Finished rods must have a 3,000 psi tensile strength. The lower ends of the rods are mounted in a rubber grommet to permit limited movement of the machine mechanism without transmitting vibration to the cabinet. Send coupon for more information on Republic Bars.



RCA Whirlpool
Imperial Mark XII
Washing Machine

SEE OUR EXHIBIT
Steel Arena
1960 METAL SHOW
PHILADELPHIA
OCT. 17-21
BUILD IT BETTER WITH AMERICA'S STEEL

STAINLESS STEEL BARS—Water pump impeller shafts are manufactured from Republic Cold Drawn Stainless Steel Bars. Shafts are turned and threaded on one end, knurled on the other and pressed into die cast impellers. Republic Stainless was chosen for its exceptional strength and resistance to the corrosive action of detergents and other elements in the wash water. Send for information on the more than 40 standard types of stainless steel offered by Republic.

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World's Widest Range of Standard Steels and Steel Products

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Please send data on:
☐ ELECTRUNITE Mechanical Tubing
☐ Stainless Steel Bars ☐ Wire

I'd like to know more about Republic's assistance in:
☐ Design ☐ Engineering ☐ Metallurgy

Specifically pertaining to:________________Product Line

Name________________Title________

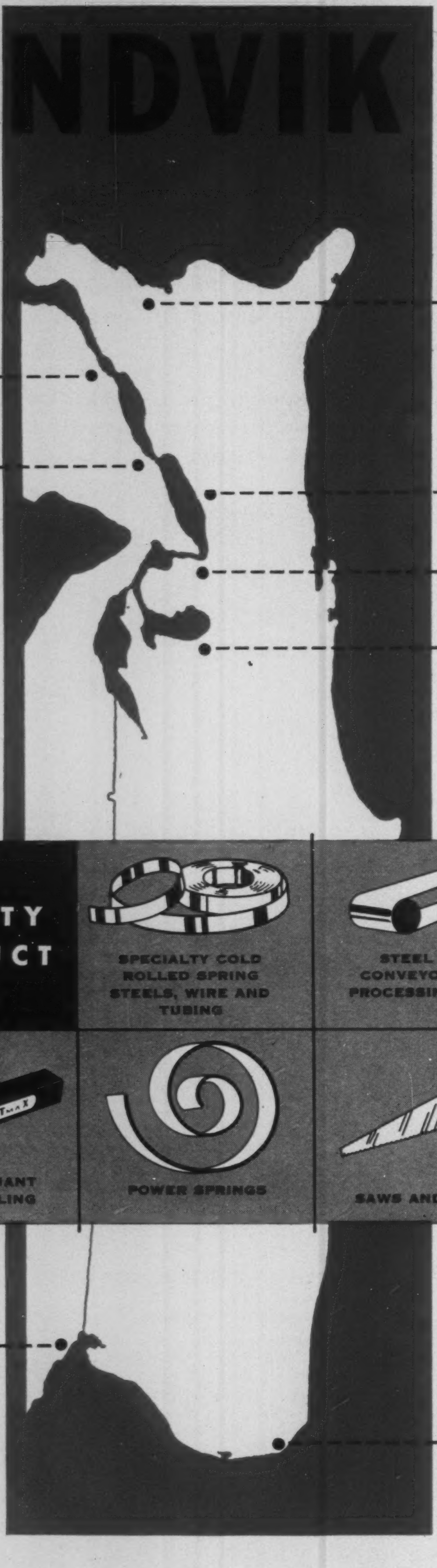
Company________________

Address________________

City____________Zone____State________

SANDVIK QUALITY AND SERVICE

. . . Available When And Where You Want Them



SANDVIK CANADIAN LTD.
MAIN OFFICE AND WAREHOUSE
P.O. Drawer 1335,
Station O.,
Montreal 9, P. Q.
RIverside 7-7501

MAIN OFFICE, WAREHOUSE, MANUFACTURING AND PROCESSING FACILITIES
1702 Nevins Road, Fair Lawn, New Jersey
SWarthmore 7-6200   In N.Y.C. ALgonquin 5-2200

SALES OFFICE AND WAREHOUSE
(Sandvik Canadian Ltd.)
23 Haas Road,
Rexdale, Ontario
CHerry 6-3552

SALES OFFICE, WAREHOUSE AND PROCESSING FACILITIES
8650 Brookpark Rd., Cleveland 29, Ohio
ONtario 1-3205

SALES OFFICE AND WAREHOUSE
14131 Puritan Ave., Detroit 27, Michigan
BRoadway 3-8474

SALES OFFICE
230 North Michigan Ave., Chicago 1, Illinois
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- SPECIALTY COLD ROLLED SPRING STEELS, WIRE AND TUBING
- STEEL BELT CONVEYORS AND PROCESSING UNITS
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SANDVIK

SALES OFFICE
(Sandvik Canadian Ltd.)
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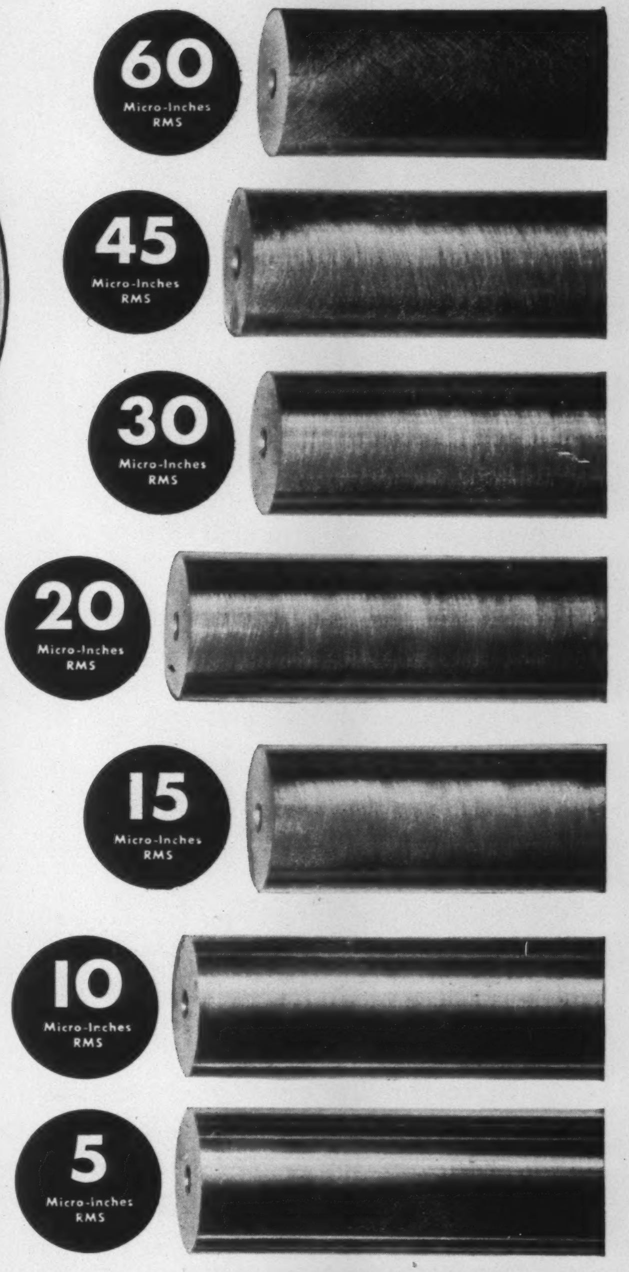
SALES OFFICE AND WAREHOUSE
3338 South Malt Ave., Los Angeles 22, California
RAymond 3-9116

SANDVIK STEEL, INC.
1702 Nevins Road, Fair Lawn, N. J.   Works: Sandviken, Sweden

[illegible]



Here's the quick, low-cost way to get any Controlled Surface Finish

Are you paying more than necessary to obtain *controlled surface finishes?* You probably are if Gisholt Superfinishing is new to you. You are losing time, money and paying a premium for quality as well, on many jobs.

With Superfinish you preselect the surface finish you need—as high as 80 or as low as 1 micro-inch RMS—and you get it faster, at less cost than by any other method. Rather than an expensive extra step, Gisholt Superfinishing actually eliminates tedious, more costly processes.

Not only do you save time and money, but you get a "controlled" surface finish, free of smear metal—with the true base metal exposed—one that provides greater area contact for heavier loads and longer life in your specific application.

Whether your job requires a 1, 20 or 80 micro-inch finish, setup is fast and easy. Nothing is left to the operator's skill or judgment. Stone pressure and grade, and reciprocation rate are preselected to produce the finish you require, for job lots or large production runs.

It will pay you to find out how Gisholt Superfinish can cut costs, improve quality and lengthen service life on your standard or problem parts. Ask your Gisholt Representative or write for Bulletin 1169.

GISHOLT
MASTERLINE
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GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin

Investigate Gisholt's Extended Payment and Leasing Plans

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • ***Factory-Rebuilt Machines with New-Machine Guarantee***

Three Reasons General Electric D-c Drives are Best for

1. Costly Maintenance Shutdowns Reduced

D-c Main Drives

In metal-rolling mills—where minutes of downtime are measured in thousands of dollars—fast, simplified maintenance of main drive motors is critical.

The revolutionary "TOP-FORWARD" twin-drive shown above exemplifies General Electric's continuing emphasis on better design for ease of maintenance. Shaft extension of the rear motor passes *beneath* the forward motor instead of directly over as in conventional designs. This unique drive arrangement allows clear access by overhead crane to all bearings, air-shields and other components of *both motors*.

Shorter over-all length of drive substantially reduces space required and provides cost savings in foundation construction. Improved Class B Insulation system for armatures and fields, utilizing proven resins and compounds, provides greater resistance to heat, moisture and dirt.

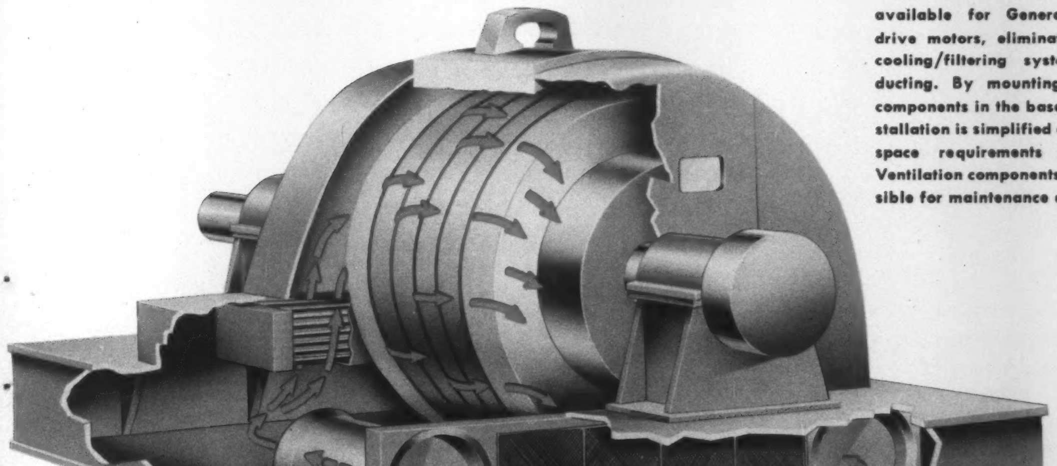
Progress Is Our Most Important Product

GENERAL ELECTRIC

Automated Production Systems

GENERAL ELECTRIC

by New Advances in D-c Drive Design



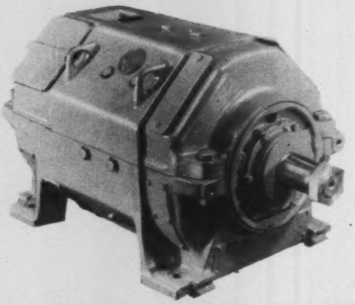
INTEGRAL VENTILATION SYSTEM, **available for General Electric main drive motors, eliminates separate air-cooling/filtering system and related ducting. By mounting all ventilation components in the base of the drive, installation is simplified and supplemental space requirements are eliminated. Ventilation components are easily accessible for maintenance and inspection.**

Three Reasons General Electric D-c Drives are Best for

GENERAL ELECTRIC

2. G-E Drives Are Durable and Reliable—

D-c Auxiliary



GENERAL ELECTRIC'S MD-600 ARMORED MOTOR is built to withstand severe shocks, give maximum reliability. Class H insulation provides superior protection—permits greater work capacity.

Designed to exceed the requirements of the most advanced continuous processing systems, General Electric MD-600 series armored mill motors are built to withstand regular exposure to hot scale, steam and corrosive sprays. Improved high temperature insulations have appreciably lengthened motor life.

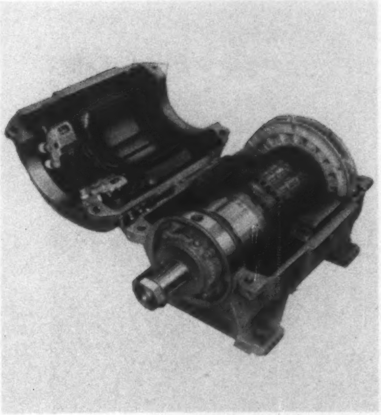
Designed to meet or exceed AISE standards in all respects, General Electric's armored motor offers unmatched flexibility. This motor can be adapted to fit any of five different ventilation requirements simply by adding or removing standard covers. No other modifications are necessary.

Progress Is Our Most Important Product

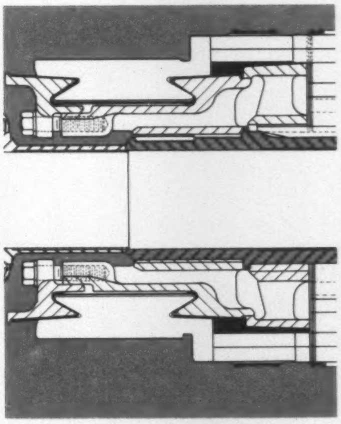
GENERAL ELECTRIC

GENERAL ELECTRIC

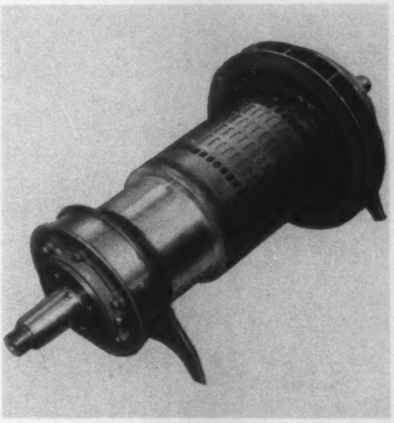
Meet Demands of Continuous Processing



DESIGNED FOR EASY ACCESS, top half of General Electric MD-600 motor frame swings open nearly 180° to permit fast armature removal. Positioning keys in frame heads facilitate armature alignment.



DESIGNED FOR EASE OF MAINTENANCE, the armature on General Electric armored motors is assembled on a steel spider so the shaft can be pressed out without disturbing commutator or windings.



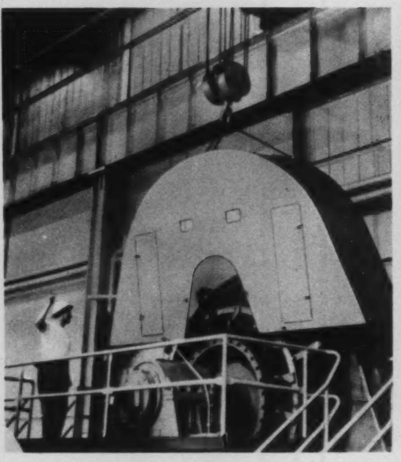
BUILT TO DRIVE HEAVIER LOADS—accelerate, start, stop and reverse faster—MD-600 motors meet toughest demands of automated systems. Integral feet on the endshields allow the armature to stand alone when removed from frame.

Three Reasons General Electric D-c Drives are Best for

GENERAL ELECTRIC

3. G-E Drives Give You New Competitive

D-c Main & Aux. Drives



NEW QUICK-REMOVABLE COVERS use no bolts, permit easy access. Tapered guide pins, attached to "TOP-FORWARD" d-c main drive motor frame, accurately position covers on base and frame. Removal and replacement time is reduced to a minimum.

CONSTANT-PRESSURE BRUSH-HOLDERS eliminate all pressure adjustments, give optimum contact at all times. General Electric brush-holder design permits observation of brush wear. Brush can be replaced in seconds.

DISC-LUBRICATED BEARINGS provide positive oiling during all operating conditions. Self-aligning, cast-steel, babbitt-lined bearings can be removed without disconnecting oil piping—maintenance is simplified.

Automated Production Systems

Advantages to Meet the Challenge of the 60's

Higher processing speeds, tighter production schedules and better product quality are requisites of industrial growth in the coming decade. As continuous processing and automation techniques spread throughout industry, rapid maintenance of basic equipment becomes an increasingly important competitive advantage.

General Electric's simplified-maintenance drive design gives you this advantage plus the high thermal and mechanical limits and improved commutation demanded of automated processes.

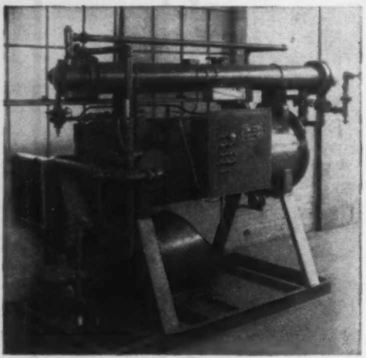
Let your G-E Sales Engineer show you how easily new d-c main and auxiliary drives can fit into your modernization plans, improve operating efficiency and help you meet the challenge of the '60's. For descriptive information on d-c motors for heavy industry, write Section 772-9, General Electric Co., Schenectady 5, N. Y. *Large Motor & Generator Dept., Schenectady, N. Y./Direct Current Motor & Generator Dept., Erie, Pennsylvania.*

Progress Is Our Most Important Product

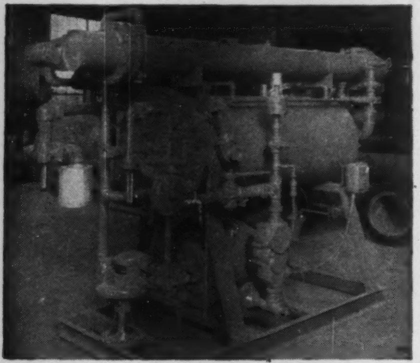
GENERAL ELECTRIC

D-c Main & Aux. Drives

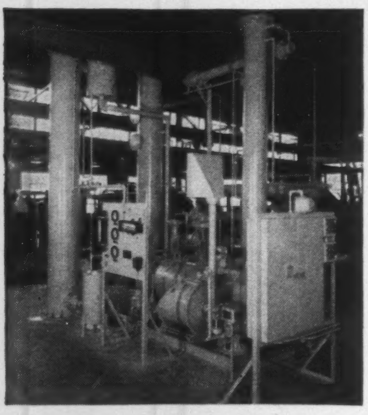
Which of these 3 KEMP GAS GENERATORS *can you use in your plant?*



1 KEMP INERT GAS GENERATOR
—for working non-ferrous metals. Produces inert gases for use at low or high pressure, desiccated or unprocessed. Kemp gives you low-cost gas generation, completely automatic operation. Premixing in exclusive Kemp Carburetor and constant analysis assures highest thermal efficiency.



2 KEMP ATMOS GAS GENERATOR
—for working low-carbon steels. For gases low in carbon dioxide. As in all Kemp Gas Generators, test burner permits checking for proper combustion characteristics before igniting burners. Another safety feature: automatic fire-checks guard against flashback.



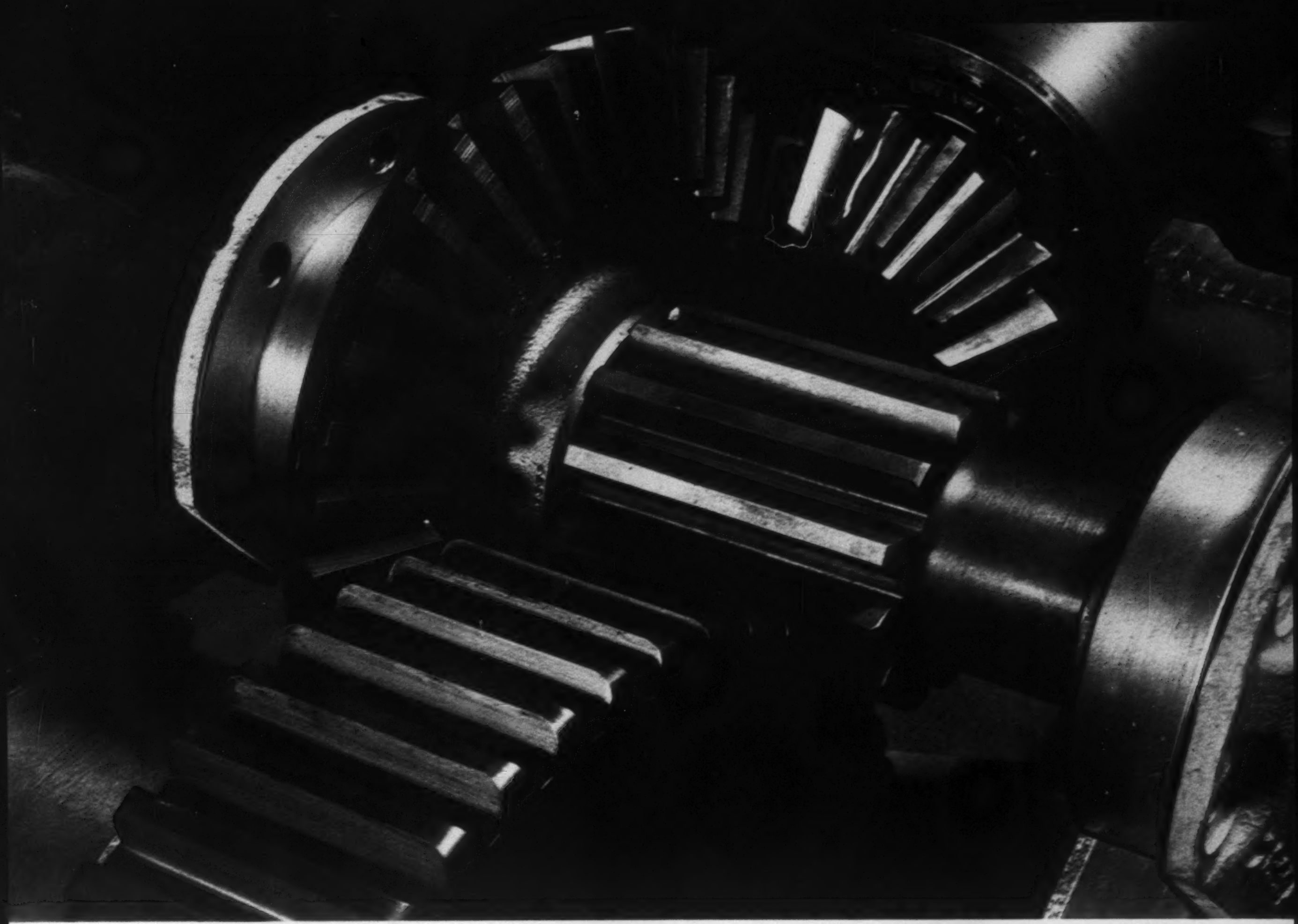
3 KEMP NITROGEN GENERATOR
—for working high-carbon steels. Completely eliminates CO_2 from gas, produces 99+% nitrogen. Features the easy start-up typical of all Kemp Generators. Vernier dial can be locked in position to maintain exact fuel-air ratio without further control manipulation.

The Kemp representative in your area can advise you on the type and size of generator to best solve your problem. Talk to him or write: THE C. M. KEMP MANUFACTURING COMPANY, 405 E. Oliver St., Baltimore 2, Maryland.

It always pays to come to

KEMP
OF BALTIMORE

THE C. M. KEMP
MANUFACTURING COMPANY
405 E. Oliver St., Baltimore 2, Md.



These gears drive the cutting head of a Lee-Norse continuous coal miner. They have superb toughness to resist impact and wear. They're made of AISI 4820, 4320, and 4817 alloy steels.

These teeth are not for chewing

Gear teeth aren't supposed to chew anything (especially each other) because it's so very *expensive*. A broken ten-dollar gear can cost a thousand dollars in down time—so it pays to use the very best alloy steels for gears and other highly stressed parts.

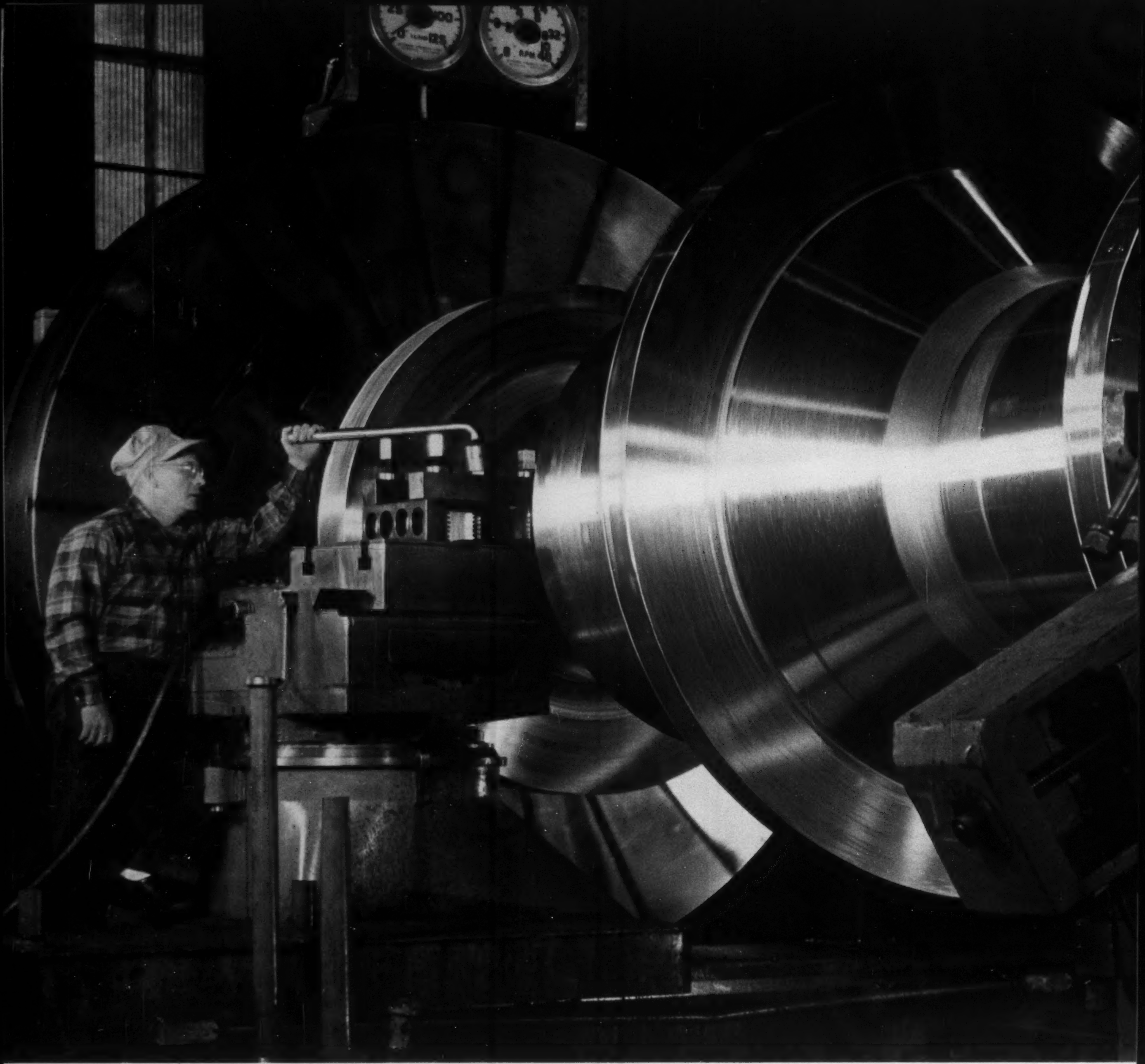
When we make USS Alloy Gear Steels, every production step has one purpose: to prevent failure in actual service. These premium steels forge and machine without distortion. They are dimensionally stable, and they come in the widest possible range of mechanical properties. Be sure to specify USS Alloy Gear Steels: Carburizing steels for toughness, shock and wear resistance; through-hardening steels for heavy loads at slow to medium speeds; cyaniding and nitriding steels for wear.

For information or metallurgical assistance, call our nearest sales office or United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS is a registered trademark

This mark tells you a product is made of modern, dependable Steel.

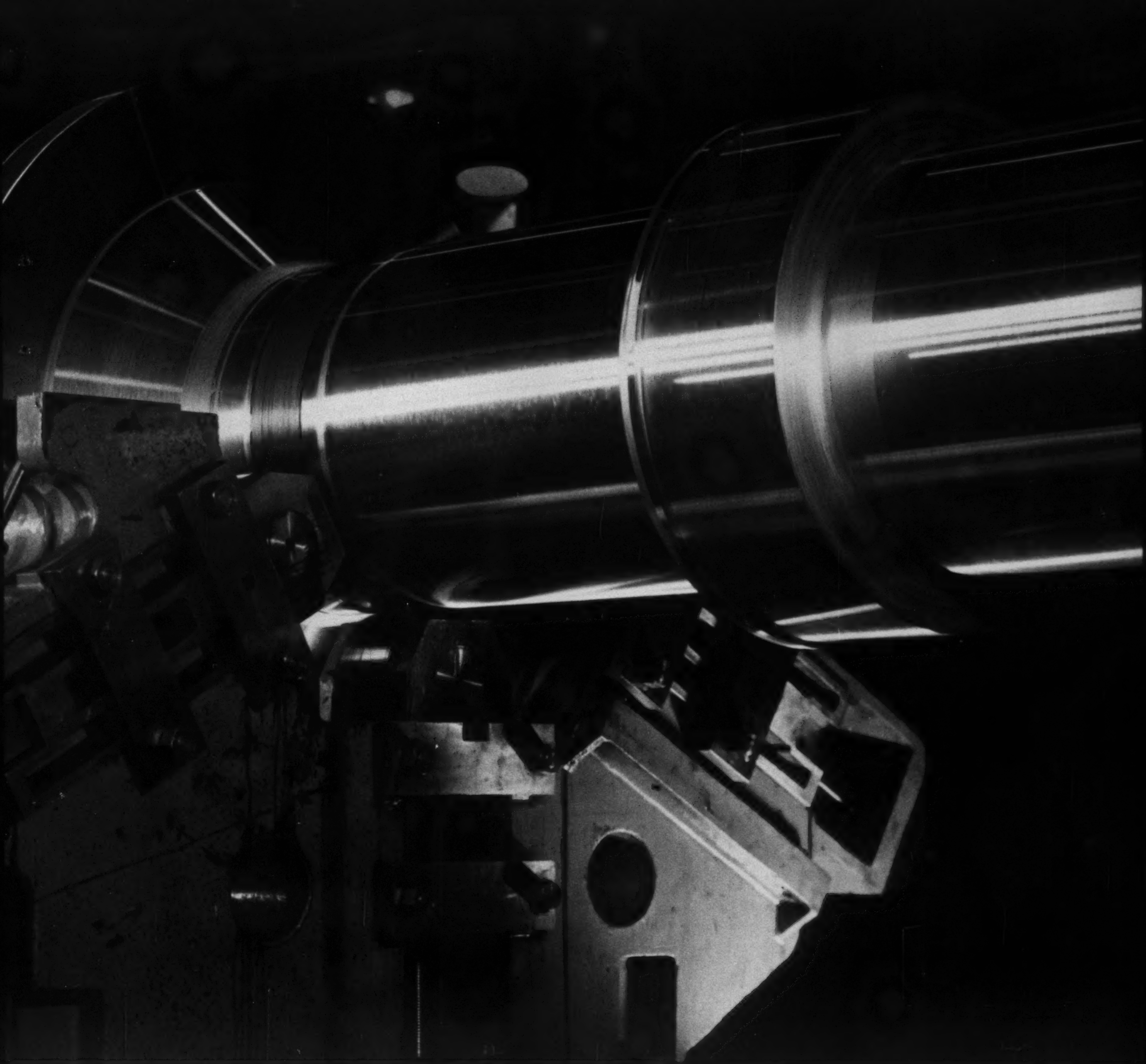
United States Steel Corporation — Pittsburgh
Columbia-Geneva Steel — San Francisco
Tennessee Coal & Iron — Fairfield, Alabama
United States Steel Supply — Steel Service Centers
United States Steel Export Company
United States Steel



This USS Forging will perform in Spain

In the main picture, you see a water wheel shaft as it was rough machined in the 120″ lathe at U. S. Steel's Homestead Works. When this USS Quality Forging was completed, it was sent to a major power plant builder where it became a part of a hydro-electric facility which will be erected in Spain. It is used as a connecting shaft between the impeller and the electrical generator. When you consider the high torque imposed upon it, you realize that this forging must be as nearly perfect as men can make it.

The forging was made from carbon steel cast into a 130″ diameter ingot, smooth forged, heat treated, and rough machined as you see it here. The forging was tested and inspected throughout its processing. As shipped,



it weighed 126,000 pounds. Five other similar forgings were delivered to the power plant builder—a total of 378 tons of water wheel shafting.

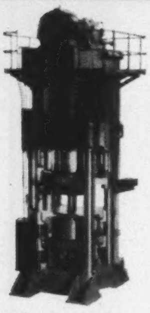
The gentleman shown at the left is positive that these forgings will perform satisfactorily. As Manager of Forgings Metallurgy at U. S. Steel, G. T. "Ted" Jones has a real and personal interest in the quality of USS Forgings. Water wheels, as well as turbine and generator forgings, are produced to most exacting specifications, but they are all capably handled by U. S. Steel forging experts. These same men can handle your forging requirements. If you would like additional information about USS Quality Forgings, write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

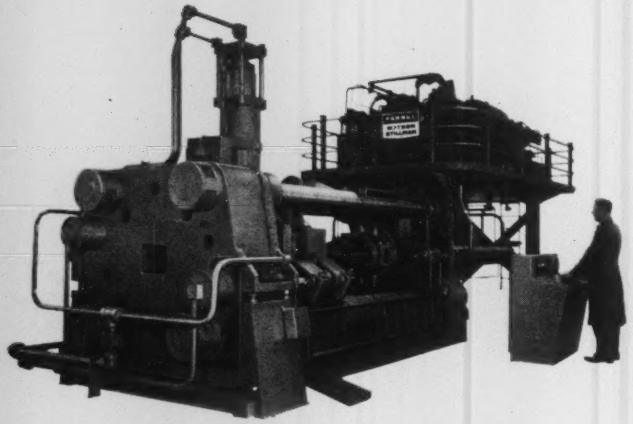
USS is a registered trademark

This mark tells you a product
is made of modern, dependable Steel.

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Export Company
United States Steel

extrusion presses for any purpose–


Lead presses for cable covering and rubber-hose vulcanizing.


Aluminum and brass extrusion presses.

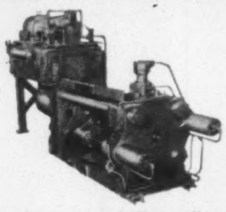
based on 100 years of experience

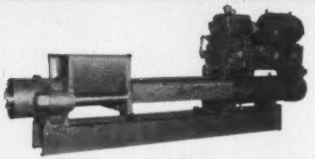
The Farrel Watson-Stillman line of extrusion presses is as broad as your requirements. And, designs are based on 100 years of experience in building hydraulic equipment tailored to individual needs.

Company engineers have helped hundreds of manufacturers to find the right equipment for a specific job . . . to raise efficiency, boost production rates and increase profits. They are ready to start work on your problem today.

Ask for a quotation on a press for extruding any of the metals or materials listed below. Capacities range up to 6,000 tons in standard or special designs.

FARREL-BIRMINGHAM COMPANY, INC.
WATSON-STILLMAN PRESS DIVISION
570 Blossom Road, Rochester 10, N. Y.
Telephone: BUtler 8-4600
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.


Phosphor-bronze and silver-alloy presses.

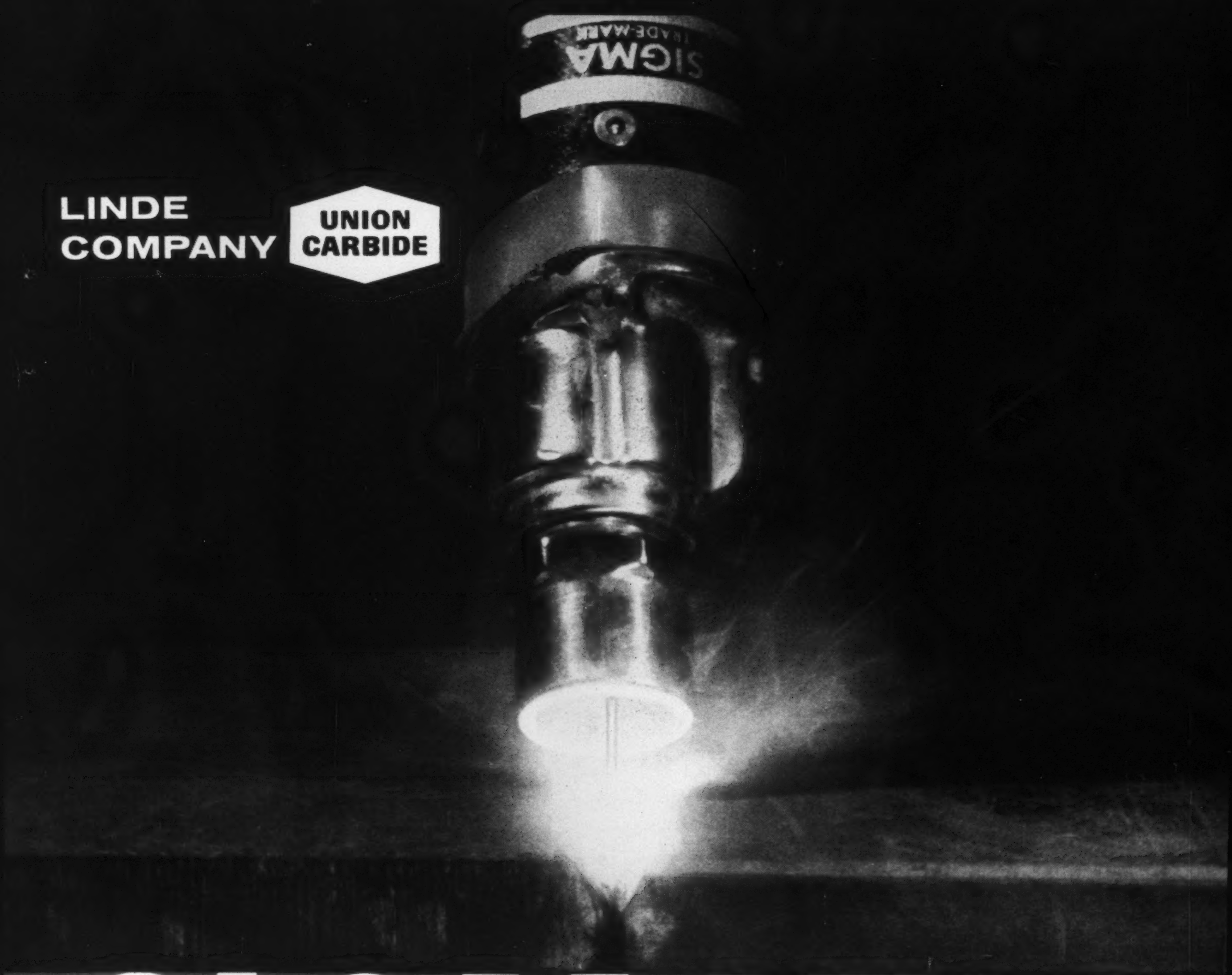

Carbon-extrusion presses.

FARREL
WATSON STILLMAN
®

TYPES OF EXTRUSION PRESSES BUILT BY WATSON-STILLMAN
aluminum • brass • bronze • carbon • ceramics • copper cordite • crayon • graphite lead • lead pipe • magnesium phosphor bronze • silver alloys and precious metals • solder steel alloys and stainless • welding rod • wire and special alloys

WS-75

LINDE COMPANY **UNION CARBIDE**



SIGMATIC

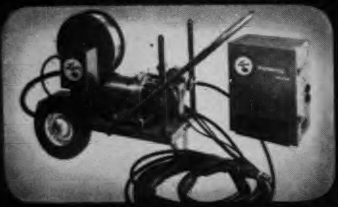
NEW ALL-IN-ONE "MIG" WELDING EQUIPMENT

Welding equipment is designed, developed and refined, but eventually it must be redesigned. LINDE'S new SIGMATIC line of "Mig" welding equipment is a product of this evolution . . . plus LINDE'S vast experience with more inert-gas and consumable-electrode processes than any other company in the world. The SIGMATIC line is the most-versatile semi-automatic equipment available anywhere—one machine for:

. . . all types of "Mig" welding—spray arc, short arc and spot welding
. . . in all welding positions—vertical, overhead or downhand
. . . with all shielding gases—argon, helium, CO_2, or their mixtures
. . . and all wires—hard or soft, solid or tube
. . . on all weldable metals—carbon steel, stainless, aluminum, magnesium, titanium
. . . on all thicknesses—sheet metal and up

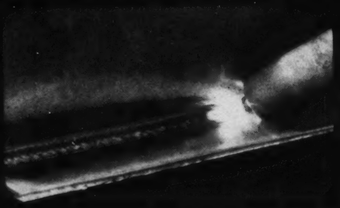
See next page for details.

SIGMATIC

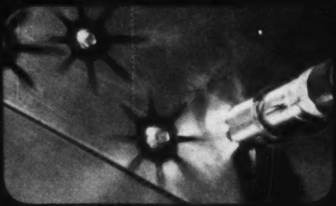


One SIGMATIC machine for...

spray arc...



short arc...



spot welding

Spray arc, short arc, spot welding... never before combined in a single piece of equipment. SCC-8 control incorporates special spot-welding circuitry, featuring a directly-calibrated, precision weld timer and an independently-adjustable, "non-stick" timer. Converts from spot to continuous fusion welding at the flick of a switch. SEH-2 heavy-duty wire-feed unit—largest, most-rugged unit available today—permits positive feed of all "Mig" wire types, metals and diameters. The SIGMATIC line contains five basic units, designed with interchangeable parts permitting more than 50 combinations tailor-made to individual specifications. Available in cart-, sled- or bench-type units.

Unique controls are vastly simplified. All components are visible and accessible. Adjustments can be made with a screw driver. Only heavy-duty industrial-type parts are used throughout each unit to insure dependable, long-life performance with minimum maintenance. Top-quality parts—"Square D" pneumatic timers, Mallory electrolytic condensers, Cutler-Hammer switches, Potter & Brumfield relays, Electrons, Inc. thyratron tubes. The SIGMATIC line is unquestionably a major welding advance—with one rugged, durable machine, you can do any type of "Mig" welding in any position on any thickness of any metal. For more information or a live demonstration, call your nearest Linde office.

LINDE
COMPANY

UNION
CARBIDE

Division of Union Carbide Corporation
270 Park Avenue, New York 17, N.Y.

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No matter what size, shape or style you need

you'll do a better filing job with a

SIMONDS RED TANG

- ★ **AMERICAN Pattern**
- ★ **SWISS Pattern**
- ★ **VIXEN Milled Curved-Tooth**
- ★ **ROTARY Files and Burrs**

(Complete Line includes All Sizes, Shapes and Types)

SIMONDS NEW **MULTI-KUT FILE** — with criss-cross design — an extremely useful all-around file for maximum stock removal, smooth finish and long life on any fileable material. Multi-Kut files are available in Flat, Half-Round, and Square in 8", 10", 12" and 14" lengths.

For hogging off metal or smooth finish filing . . . for intricate die work or production de-burring . . . for sharpening saws or restoring knife and tool edges to former cut-ability, Simonds RED TANG Files make your work easier . . . make your file dollars go farther. They cut fast and sure . . . last longer, too . . . because they're FIRST QUALITY only. They're sharper to start with . . . resist wear . . . keep right on cutting long after other files are dull and useless. These are facts we can prove — so can you by simply specifying SIMONDS RED TANG on your next file order. All sizes, shapes and types in all patterns are available from stock in the complete Simonds line.

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SERVING INDUSTRY ECONOMICALLY
THE RIGHT HAND OF PRODUCTION

Your nearby SIMONDS DISTRIBUTOR is your most dependable cutting tool supply source. His stocks and services are designed with your convenience and economy in mind. Call him FIRST for all your industrial supply needs!

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Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon • Canadian Factory in Granby, Que. • Simonds Divisions: Simonds Steel Mill, Lockport, New York; Heller Tool Co., Newcomerstown, Ohio; Simonds Abrasive Co., Philadelphia, Pa. and Arvida, Que., Canada

METALGRAMS

UNION CARBIDE METALS

. . . news of "Electromet" ferroalloys and metals

SEPTEMBER 1960

MORE ELECTROLYTIC MANGANESE -- To meet the increasing demand for "Elmang" electrolytic manganese metal, Union Carbide Metals has expanded its cell capacity by 20 per cent. Hence, a larger supply of this high-purity product (99.9 per cent minimum manganese) is assured for additions to steel, copper, and aluminum. Also of interest: (1) The metal is now available in 50-lb. bags for convenient, accurate additions. (2) The 600-lb. drums of "Elmang" manganese are now color-coded to allow easy identification of the regular, dehydrogenated, and nitrogen-bearing grades. Write for new specification sheet, F-20,151.

* * *

ALLOYS FOR BASIC-OXYGEN STEELMAKING -- Interest has been focused on the basic-oxygen process because it can make high-quality steel rapidly and at low cost. Small accurate alloy additions can be made to the ladle of basic-oxygen heats with bagged alloys. Where large chromium and manganese additions are required, "Chromtemp" ferrochrome and "Mantemp" ferromanganese can be added to the ladle. All these unit-weight packages allow precise analysis control. Also, furnace time is not required to dissolve the alloys in steel. Your UCM representative will be glad to give you further details. Also, write for the article, "O_2 Steelmaking," in the Spring issue of UNION CARBIDE METALS REVIEW.

* * *

SILICON IN COPPER -- First developed in France in 1881, silicon bronze is growing rapidly as a corrosion-resistant material for vessels, tubing, marine and poleline hardware, and electrical conduit. Up to 3 per cent silicon provides strength and hardness. For such additions, Union Carbide Metals offers a low-aluminum silicon metal. Since aluminum makes bronze sluggish in pouring, this special grade contains a maximum of 0.10 per cent aluminum. For further information, contact your UCM representative. Also, write for the article, "Silicon Strengthens Copper," in the Winter 1960 issue of UNION CARBIDE METALS REVIEW.

* * *

SERVICE ON THE MOVE -- Every year, experienced metallurgists of UCM's Metallurgical Service Division travel tens of thousands of miles to customers' plants. Their mission: to provide on-the-site help on the use of ferroalloys and alloying metals in melting. As an example, a Metallurgical Service representative worked with Electric Steel Foundry Company of Portland in evaluating the new fast-dissolving "Simplex" ferrochrome in stainless steel. The joint effort showed that 5- to 7-minute savings in furnace time could be made per 2,000 lb. heat. For a picture story of this cooperative service, write for "Service on the Move" in the Winter 1960 issue of UNION CARBIDE METALS REVIEW.

* * *

HIGHER DUCTILITY WITH CALCIUM-SILICON -- Two Midwestern steel foundries recently obtained data on Grade B steel castings made with and without calcium-silicon. In one test of 91 production heats, all of the heats treated with calcium-silicon and aluminum produced castings with satisfactory ductility. As a comparison, over 25 per cent of the heats deoxidized only with aluminum failed to meet reduction-in-area specifications. In another test of 20 production heats, a 15 to 20 per cent improvement in ductility (% RA) was reported. Further data can be obtained by writing for the article, "Calcium Improves Ductility of Steel Castings," in the Summer 1960 issue of UNION CARBIDE METALS REVIEW.

* * *

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation,
270 Park Ave., New York 17, N. Y. In Canada: Union Carbide Canada Ltd., Toronto.

"Chromtemp," "Electromet," "Elmang," "Mantemp," "Simplex," and "Union Carbide" are registered trade marks of Union Carbide Corporation.

PRODUCERS OF BASIC MATERIALS are becoming more aggressive in designing their new products for new markets. A good example is U. S. Steel's intensive industrial design campaign. Comments Bay Estes, U. S. Steel vice president: "Customers owe no permanent loyalty to steel as a material. What we intend to show is that steel can do a multitude of jobs outside the ordinary."

EASIER CREDIT IS PROMISED as Dr. Woodlief Thomas, adviser to Federal Reserve Board of Governors, finds "no reason for restraints on credit expansion." Also, the American Bankers Assn. has just hailed the Board's shift to a money policy of "moderate ease," and hints it should go further.

DOLLAR SALES UP, PROFIT RATES DOWN, is the picture for metalworking machinery and equipment. Sales for the second quarter of this year were $941 million, compared to sales of $867 million for the first quarter 1960, and $809 million for the second quarter 1959. Net profit on sales for these three periods was 2.7 pct, 3.1 pct, and 3.2 pct, respectively.

ALL-AROUND MARKETING EFFORT IS NEEDED to battle foreign competition. Most foreign products in U.S. market are chiefly price competitive, reminds Michigan U. professor Dr. L. P. Dowd, in Journal of Marketing. Says Dr. Dowd; "The cheapest products, whether aspirins, frying pans, refrigerators, etc, are commonly not the largest volume sellers."

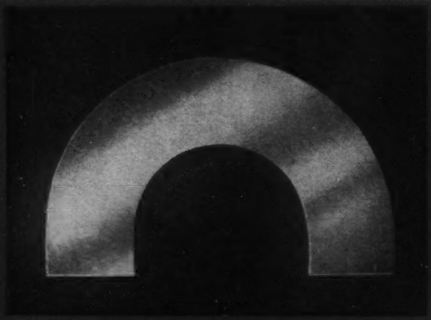
LESS CHROME WILL BE USED ON 1961 AUTOS. The reason: Compact cars and smaller bumpers on standard models. Nickel consumption isn't expected to be affected much, however, because more cars will increase the depth of nickel coating.

PRODUCTION CUTBACKS HIT SOME HEAVY-DUTY TRUCK MAKERS. A softening of this part of the truck market is indicated as parts suppliers for some of the medium and heavy truck makers already have gone on short workweeks. So far, light truck makers haven't shown signs of slowing down.

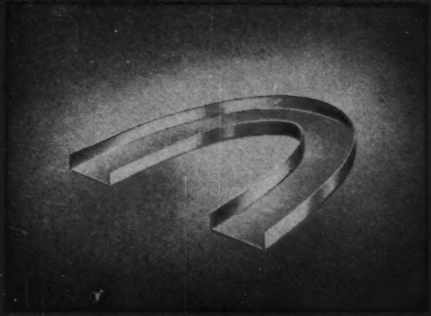
BRIGHT SPOTS APPEAR IN FOUNDRY INDUSTRY. At least two important producers of grey iron castings report that their sales picture for light castings has taken a turn for the better in the past two weeks.

*$100.00 per part production SAVINGS...... ...with the

OLD METHOD



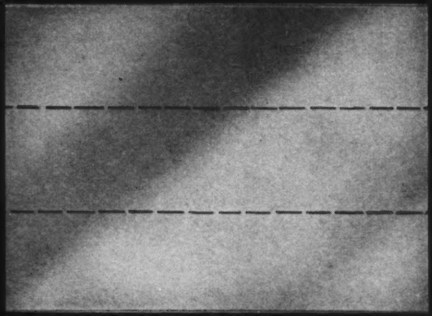
Cutting out the blank in this titanium piece was [illegible]



Drop Hammer operation resulted in heavy scrap loss.

Finished part

BATH METHOD



3 titanium parts per piece instead of one.

Radial Draw Forming prior to Drop Hammer operation eliminated metal distortion, greatly reduced rejects.

Finished part

*The illustrated titanium part was not only expensive to make by old methods, but because of metal distortion, the part reject loss was tremendous. By STRETCH RELIEVING the titanium, using a Bath Radial Draw Former, part rejects were practically eliminated . . . in short, a method of forming shapes that keep their shape . . . even after heat treating *. . . Send for the plant facilities folder, it illustrates both the standard Radial Draw Forming facilities, plus a completely new series of HIGH SPEED production forming machines.*

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32340 AURORA ROAD • SOLON, OHIO
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Job Security Takes Over As Steelworkers' Top Demand

USWA convention finds steelworkers worried, but militant.

Loss of jobs is the big concern. Lack of progress on work rules and human rights committees has the union on edge.—By Tom Campbell.

▪ The spectre of recession, unemployment, and short time took its seat at the United Steelworkers convention at Atlantic City last week. And its influence was felt in the resolutions, debates, and the anxieties of most delegates.

With the steel industry in the throes of its worst recession since the late thirties, the temper of the Steelworkers was one of defensive fringe thinking. Talks with delegates and union officers disclosed fear that the steel industry was now a six to nine month business.

Like Coal?—Some comparisons were made with the coal miners, who now number less than 200,000. Not too many years ago they numbered more than 650,000. The oft-mentioned culprit to plague steelworkers: Automation.

Even the doctors, hospitals and insurance firms came in for bitter criticism at the steel union meetings. So strong is the feeling among steel union officials over doctors' fees, hospital service, and alleged unnecessary operations that the union advocated pilot clinics for pre-paid medical attention.

Health Demands—There was evidence of what is ahead in this area of health care: The steel union will attempt to determine if pre-paid medical help via clinics—with salaried doctors—is the answer to its charges of completely unsatisfactory experiences with private doctors and hospitalization and medical programs. If anything comes of this pilot plan, the bill would fall to the

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What Are the Steelworkers Going After in 1962?

Sign posts pointing toward steelworkers goals in 1962 bargaining sessions bobbed up aplenty last week at the union's convention. On the floor and off the floor there was little or no discussion of wages. That may come along as a routine demand. But the top billings last week went to defensive fringe goals.

Here is the way some of the things shaped up. But there will be plenty of change between now and the end of the contract period on June 31, 1962:

Supplementary Unemployment Benefits: The union wants to revise this from A to Z. Biggest demand will be to provide more money for the workers out of work. Eligibility rules are criticised. Also the union wants better financial arrangements for the fund. The basis for the demands appears to stem from the rapid deterioration of working time for many employees not too long after the 116 day strike. There is also the fear that the steel industry will move rapidy into more automation—with a much lower operating rate as "normal."

Social Insurance: The union wants more life insurance with the provision of maintaining full amount after retirement. It wants an increase in sick and accident benefits with development of a complete and comprehensive medical care program. This last suggestion means the union wants pilot plans to establish clinics and pre-paid medical care. It also wants the steel firms to use some of the pension money to build hospitals in steel towns.

Pension: There will be a continual drive to get more benefits. The union also reindorses the voluntary system of retirement.

Medical Care Plans: The union leans toward these plans and apparently is out to bear down on Blue Cross and Blue Shield service on the basis that it feels members are being inadequately serviced and over-charged. They use the term "outrageous" in explaining some of the medical charges.

Wages: Nowhere are wages mentioned. But it is axiomatic that the union will come up with a formula in due time.

TOGETHERNESS: Labor Secretary James Mitchell (left) agrees with USWA president David J. McDonald and delegates to the union's convention that labor and management must continue joint committee efforts to reach a common ground for solving industry problems.

steel industry; it now picks up the tab on the health plans.

Layoffs Follow Strike — Aftereffects of the 116-day strike and the subsequent recession in steel—all within a year of each other—sparked other symptoms of job security emphasis. Repeated remarks were leveled at the apparent slowness of the joint Work Practices Committee and the Human Relations Committee to "get off the ground." These groups were formed as a part of the recent steel contract.

Reports have been prevalent for some time that little progress has been made by either committee. The local practices committee must submit its report by the end of November.

Little Agreement—So far, no more than exploratory action has been taken. Even the question of a neutral member has had to be bypassed because of non-agreement. In order not to hold up the work, it was decided to set aside the question of a neutral member for the time being. But the temper of remarks at the convention suggested that it must be a miracle if any agreement were to be reached on the explosive subject of work practices by the end of November. There was speculation—backed by experienced guessers—that there might be two reports at the end of the deadline; one by the union and one by management.

An ironic part of the Human Relations Committee is that its two co-chairman—union president David J. McDonald and R. Conrad Cooper, U. S. Steel vice president—are the same people who failed to reach any kind of an agreement in the negotiations until after a 116-day strike. Personal feelings of the two tend to enter into the picture. But the working—or technical—committees are making some progress defining and exploring what they are going to talk about. In this world of poor communication between the industry and the union, this should be labeled progress.

Furthermore, the industry—with 11 companies—has far more complex problems than does the union.

Mitchell Disappointed—The big question on human relations is what happens after an agenda is agreed upon. Chances are that it might take considerably longer time than Secretary of Labor Mitchell would hope for. He remarked in his talk to union delegates that efforts to date to find a solution to human relations problems have fallen far short of the high hopes he had when the contract was signed.

Mr. Mitchell bluntly suggested that there will be little progress in the steel labor-management armistice unless Dave McDonald and his top staff and Roger Blough and his staff have year-round communication with each other. He argued that today's problems were so complex that they have to be talked about—at the top level—not once in awhile, but all the time.

Strike Post Mortems—For the first time, a government official brought out into the open the point that a settlement of the steel strike last June or early July had been a distinct probability. He said that had top steel management understood the union's solidarity and resistance to the local working conditions demands of the steel industry, there might not have been a strike at all.

Despite the belief in some quarters that there may be some "progress" in both sides getting somewhere in the Human Relations and Work Practices Committee meetings, top union officials privately are leary of the steel industry's attitude. True or not, steel union people—with some exceptions—believe steel officials are dragging their feet.

Rarick, Too—Two major outbreaks between so-called Organization for Membership Rights—a rebel faction—and regular union members broke out at the meeting last week (See p. 9). Charges and counter charges were hurled with Donald C. Rarick, the rebel leader and candidate for the union presidency, declaring his life was in danger. This was denied. Old-time observers labeled the whole thing as an anti-McDonald group which was attempting to unseat the silver-haired president at the election next spring. Chances of them doing this were regarded as slim—if not nonexistent.

From all major talks, and from side bar talks, it was clear that steel management will be up against a strong string of demands, a move to counter automation by job security fringe and an attempt to enlarge, expand or otherwise change pension, health and layoff benefits.

Inco Previews Stainless Market

Stainless steel use will jump more than 80 pct in ten-year period, according to survey of International Nickel Co.

Tonnage going into appliances, utensils, and cutlery should double between 1957 and 1967.—By F. J. Starin.

■ In seven years U. S. consumption of stainless steel will hit about 1.112 million tons, the International Nickel Co. predicts.

This will be about 87 pct better than sales in 1957. And the percentage growth of the stainless steel market will outdistance that of both alloy and carbon steel.

Cause for Study—This prediction led off the recent announcement of International Nickel's new survey on the stainless steel market. To probe this potential, Inco is spending close to $250,000. Why?

Lars R. Larson, vice president and manager of the general sales and marketing service department explains, "About 65 pct of all stainless steels are nickel grades containing about 10 pct nickel. It's our largest market. So if we want to sell more nickel we have to help sell more stainless steel."

Inco's study is being published in 20 volumes—one for each of the major stainless steel markets. Each study will consider the market by geographical areas and mill shapes.

Two Plus Eighteen — The first volume, on appliances, utensils, and cutlery, is out. The next, on food processing, will be available within days. And the other 18 will be released two per month for the next nine months.

Inco says its study of the appliances, utensils, and cutlery market indicates sales of stainless should double from 1957 by 1967—to about 76,800 tons.

In appliances, Inco says the major problem is the approach of market saturation. "Refrigerators, washers and ranges are now owned by 85 pct of the people owning wired dwellings," the study points out. But in utensils and cutlery, "Demand is steady and growing with a constant turnover factor."

The major stainless shape by far for appliances, utensils and cutlery is cold-rolled strip. Total sales, from both mills and service centers in 1957 was 28,198 tons. This should reach 56,000 tons by 1967. says Inco.

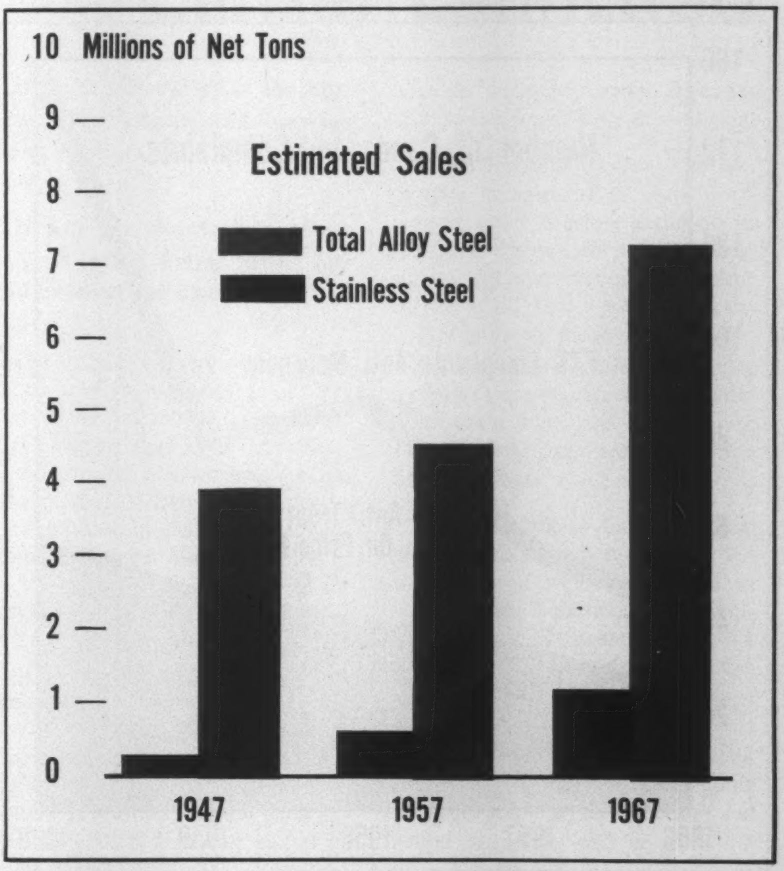
Shipping Pattern — Cold-rolled sheets, shipped to this market dropped to 5982 tons in 1957 from the 10,147 tons in 1947. But sheet demand should more than recover in the next ten year period to about 11,800 tons.

Shipments of other stainless shapes to appliance, utensil, and cutlery makers will be fairly small. But growth is predicted for all but hot-rolled strip, which has already fallen off to near nothing.

According to the Inco study, mills account for the major share of stainless shipments to appliances, utensils and cutlery makers. In 1957 they shipped 34,610 tons compared to 4014 tons for service centers. This situation is expected to hold steady until 1967.

Inco expects mills to ship 68,820 tons to this market then, while service centers sell 7980 tons.

How Stainless Gains Compare



Do U.S. Rules Hamper Pricing?

Conflicting Views Could Box In Industry

Both the Justice Dept. and the Federal Trade Commission are charged with preventing price abuses.

But differing views on what's right could put business in the middle.—By G. J. McManus.

- Price men are starting to wonder if recent Federal moves may not be shoving salesmen into a legal box.

Both the Dept. of Justice and the Federal Trade Commission are moving strongly against violations of price laws. Some businessmen fear the different approaches of the two agencies may saddle industry with conflicting and restrictive price principles.

Conflict of Ideas?—Basically, the antitrust division of the Justice Dept. seeks to keep companies from holding prices up by illegal means. Any collusion or conspiracy to fix prices falls in the antitrust field.

On the other hand, FTC works to keep companies from cutting prices in some illegal manner. The commission is charged with enforcing Robinson-Patman provisions on price discrimination.

Both bodies have the ultimate aim of preserving healthy competition. However, there is a question how far either approach can be carried without conflicting with the other. In the current situation, there is a question whether FTC's tough attitude on price discrimination may not either force a company into antitrust violations or force a relaxing of antitrust restrictions.

Strong Enforcement—Right now, there is no sign of any relaxing. The Justice Dept. this year has filed 58 cases involving price fixing. This is double the number filed in 1956 and 12 more than the 1959 total.

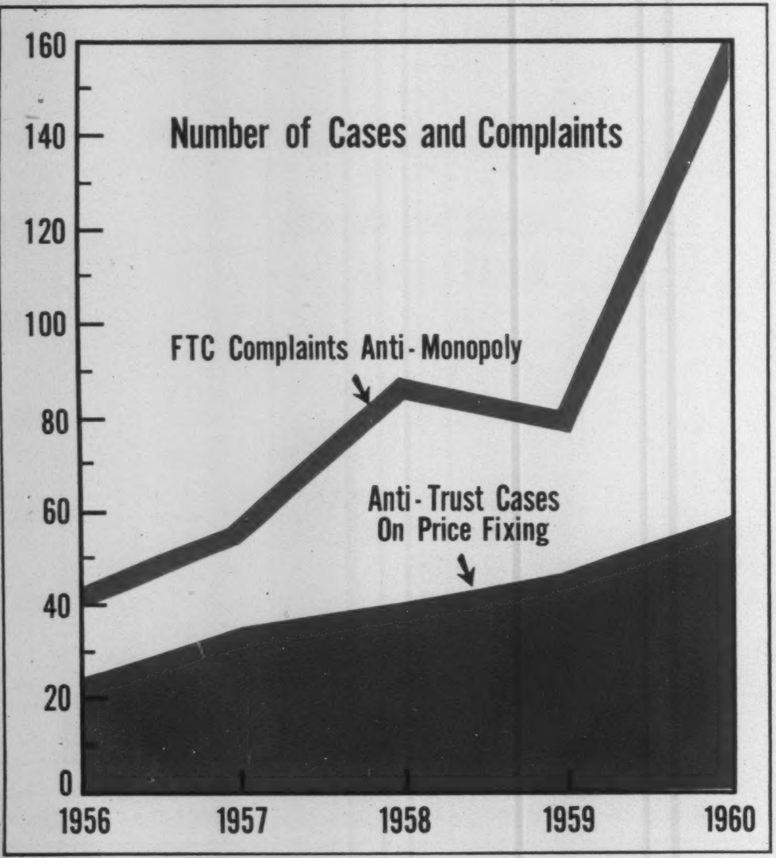
The rise in price fixing cases does not seem to indicate any special new doctrine in this field; it merely reflects the general tightening of antitrust enforcement under Robert A. Bicks, acting assistant attorney general, antitrust division.

And recent jail sentences do not point to a new federal policy of harsh punishment. In one case, an individual judge went beyond the recommendation of the Justice Dept. when he imposed jail terms on two businessmen. In other cases of this type, there were special circumstances, including violence. The price actions in the electrical field involve no new principle or policy.

Step-up By FTC—On price discrimination, the situation is a little different. FTC is applying new thinking as well as stepping up its activity (see chart). In the last fiscal year, the commission issued 130 complaints alleging violation of Robinson - Patman. This was a sharp jump from the 1959 total of 66. It was more than double the number for any previous year since 1936.

"Despite this dramatic increase," says FTC chairman Earl W. Kinter, "it seems clear to me that we have only scratched the surface."

U.S. Gets Tough on Price Laws



More Cases Pending—Mr. Kinter backs this statement with figures on investigations. At the end of last June, the commission had 249 cases up for investigation. By the end of this June, the agency had 504 cases pending.

Mr. Kinter makes clear his conviction that discriminatory price practices are widespread. "The role of Robinson-Patman . . . has yet to be determined," he says, "because compliance in depth throughout our distribution system has never really been tried."

Equally clear is the determination of the FTC to enforce compliance.

". . . We are only now seeing, in my opinion, the first really concerted effort to try out the Robinson-Patman Act," says Mr. Kinter.

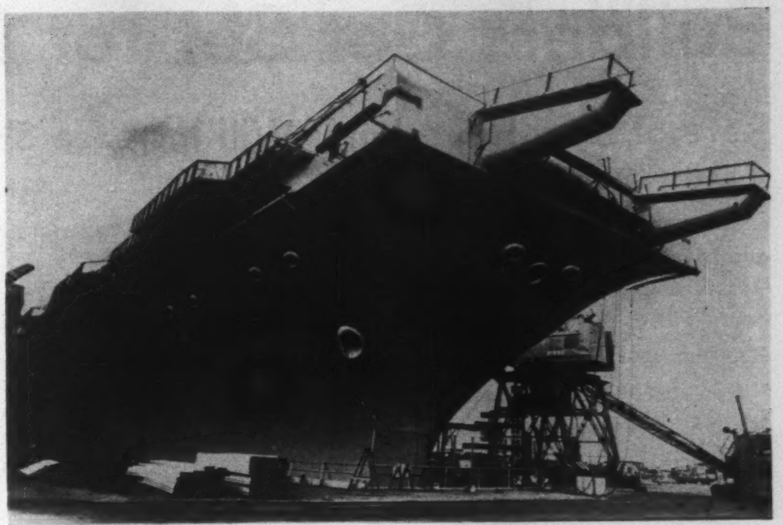
Mass Inquiries—In line with this thinking, the commission has moved vigorously to strengthen and spell out the lines of enforcement. The FTC staff was increased by 6 pct last year. A new method of mass investigation was recently adopted.

Using the new investigation technique, FTC recently directed 118 citrus fruit packers to submit reports on brokerage arrangements. Information received has led to 54 complaints of violations.

This kind of mass inquiry has been criticized as harassment, an invasion of privacy, and a demand for self incrimination. Mr. Kinter says court rulings have established the legality of the technique beyond question.

Narrower View?—In the matter of spelling out violations, FTC has moved decisively in several areas. The one big exception to the principle of uniform pricing has been that a company may offer special prices in order to meet a competitive situation. It is because of this exception that freight equalization, regional pricing and spot price cuts are possible.

What is Discriminatory?—FTC says discriminatory services may include advertising, catalogs, demonstrators, warehouse facilities, credit returns and promotion prizes.



BIGGEST: U. S. S. Enterprise is first nuclear carrier, and biggest ship.

Nuclear Powered Carrier Launched

U. S. S. Enterprise is the biggest ship afloat and carries many firsts in its 1101-ft structure.

It will join the fleet in about a year after being fitted out and readied for operations.

▪ The U. S. S. Enterprise is a floating mass of superlatives.

It is the first nuclear carrier. It is the biggest ship afloat anywhere. It will be the first nuclear surface combat ship. It carries the greatest concentration of electrical and electronic equipment ever assembled in such a compact space. These are just a few.

The Enterprise was launched Sept. 24 at the Newport News Shipbuilding and Dry Dock Co. It will be roughly a year before it is commissioned and joins the fleet. Costing in the hundreds of millions of dollars, it is an 85,000-ton giant extending 1101 ft from one end of its flight deck to the other. It will be able, in theory, to travel 20 times around the world without refueling.

Most Powerful Power—The Enterprise is powered by eight pressurized water reactors arranged in four dial systems to drive its four screws. In combination, they make up the world's most powerful atomic power plant, afloat or ashore.

Its appearance is distinguished by a square superstructure, dual catapults at the bow, and, logically, no smoke stacks are needed for the nuclear power.

Miles and Miles—Some statistics: 60,923 tons of structural steel; 3.4 million lb of weld metal used in construction; 3 million lb of aluminum used in its construction; 625 miles of electrical cable; 4080 miles of ¼-in. welding; 230 miles of pipe and tubing.

Keel of the Enterprise was laid Feb. 4, 1958, which means the time between start of construction and actual operation will be over 3.5 years.

Builders Get Set for Big Decade

Rate of New Households Will Increase Sharply

The next 10 years should be good ones for home builders. Census officials say rate of new households will greatly increase.

However, the building industry must clear a major hurdle: Cost.—By B. F. Surer.

▪ The housing industry sees little to cheer about this year. However, all indications are that a slow upswing will start in 1961 culminating in home building of "boom" proportions by 1969.

The Dept. of Commerce predicts 1.36 million housing starts in 1960 compared with 1.55 million starts last year. The rate of annual housing starts by last month, for example, was 12 pct below August, 1959.

Expenditures for housing starts this year are expected to decline by 10 pct, although the numerical drop is closer to 13 pct. This points to a trend toward larger and better quality homes.

Positive Factors—In the past 15 years, a housing shortage created a ready-made market for builders. However, the shortage no longer exists. But officials at the Census Bureau, Dept. of Commerce, say the statistical outlook for builders is rosy.

This is the shape of things to come:

1. In the next few years, the rate of new households established will increase greatly because of the population growth that started after the war.
2. The number of children under 18 years of age will increase rapidly during the next decade. This should create a need for more space.
3. The U. S. population is currently growing at a rate well over three million a year. At this rate, the population will total 195 million by 1965 and reach 214 million by 1970.
4. The present decline in the birth rate won't affect the housing market until after 1975.

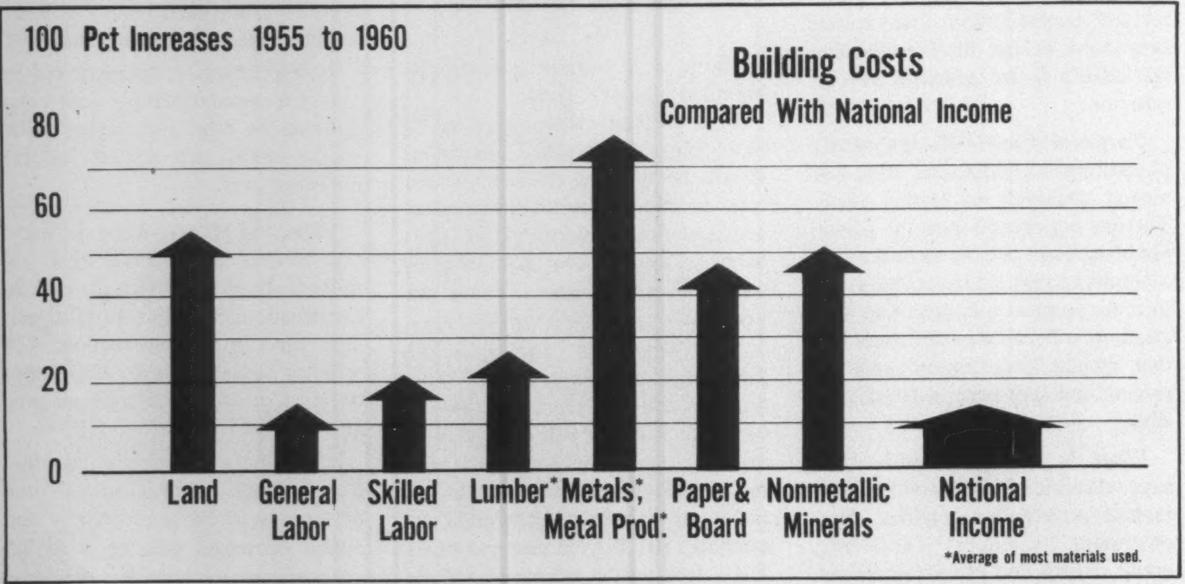
New Households—Naturally, home builders are especially interested in the rate of family formations. Since 1950, this rate has been relatively low, averaging around 849,000 new households annually. However, the rate is expected to climb slowly during the next six years with estimates about 22 pct above this year.

By the end of the decade, though, there will be more than 1.5 million new households annually for an increase of 73 pct.

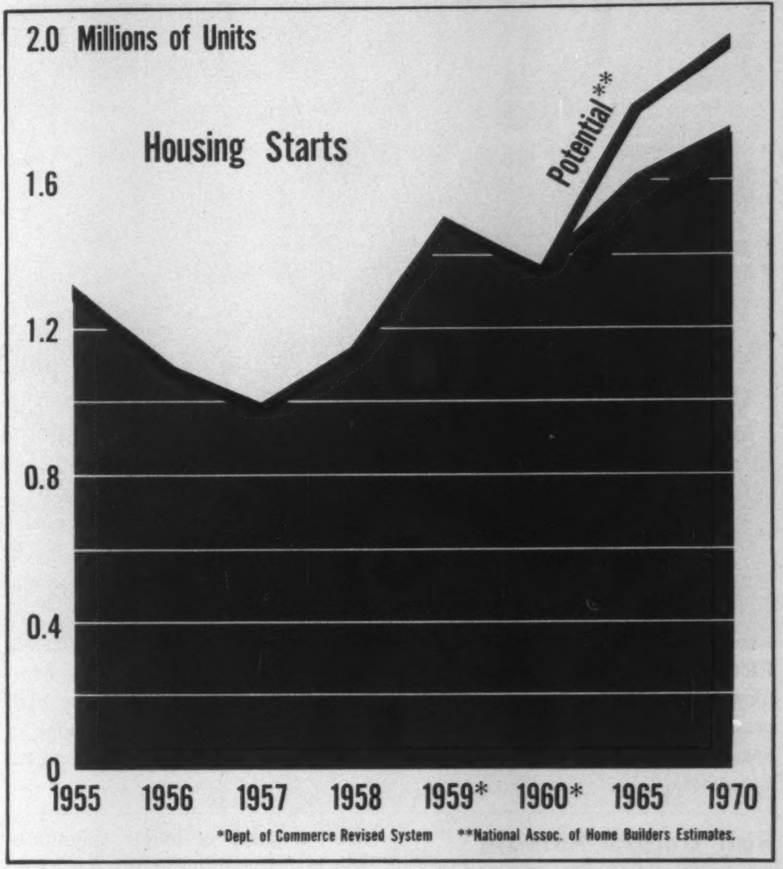
Nathaniel H. Rogg, director of economics, National Assn. of Home Builders, says the basic shelter requirements during the 1960's will mean 16 million new dwellings.

Economists at F. W. Dodge Corp. estimate residential building will increase from the $23.3 billion reported last year to an annual figure

Costs Rise Faster Than Income



Housing Market Due for Boom?



of $31.1 billion by 1969. As measured in 1959 dollars, this means a 33 pct increase in physical volume.

And Other Markets — Builders are also studying other markets. Experts say there is a trend toward vacation homes or "two-house families." A recent survey by the National Assn. of Real Estate Boards confirms that there are already nearly 2 million two-house owners. During the 1960's, it is expected that another 200,000 buyers will enter this market annually.

When home building booms, many industries thrive. Manufacturers of building materials such as lumber, metal and metal products, paper, board and nonmetallic minerals should also realize larger profits. Appliance manufacturers, who are already creating an intricate tie with home builders, welcome increased housing starts.

Negative Factors—But even with this rosy outlook, the building industry has hurdles to clear. Mr. Rogg notes, "This population explosion will not automatically guarantee golden years for everybody connected with the building industry."

The highest hurdle the industry must clear is cost.

Many business analysts feel builders may be pricing themselves out of the market. Charles P. Redick, director, Building Materials Div., Dept. of Commerce, told The IRON AGE, "We will need homes in the 1960's and people will gobble them up if builders don't price themselves out of the market."

Chief among the reasons for the rising price of homes is the cost of land. Mr. Redick says "ridiculous" profits are being made from the sale of land.

Other Cost Factors—Of course, other factors are also involved in the rising cost of home building. Weekly earnings of general contractors are up 15 pct from 1954. Special trade contractors, such as electricians and plumbers, have gained 22 pct.

Wholesale price of most wood is up 30 pct or more from 1950. Metals have increased in price by 60 pct to 99 pct. Paper and board is up at least 48 pct, and nonmetallic minerals have increased in price as much as 52 pct.

Although national income has also risen, the ratio is out of proportion. Dept. of Commerce statistics show the overall national income has risen approximately 14 pct since 1955. The median income of non-farm families is now just over $6,000 and rising about 2 pct annually.

Curbing Steps—Steps are being taken, however, to curb residential cost spiralling. There is, for example, growing technological competition among building materials manufacturers. A leading technique being employed is the use of factory-made components.

The results are two-fold:

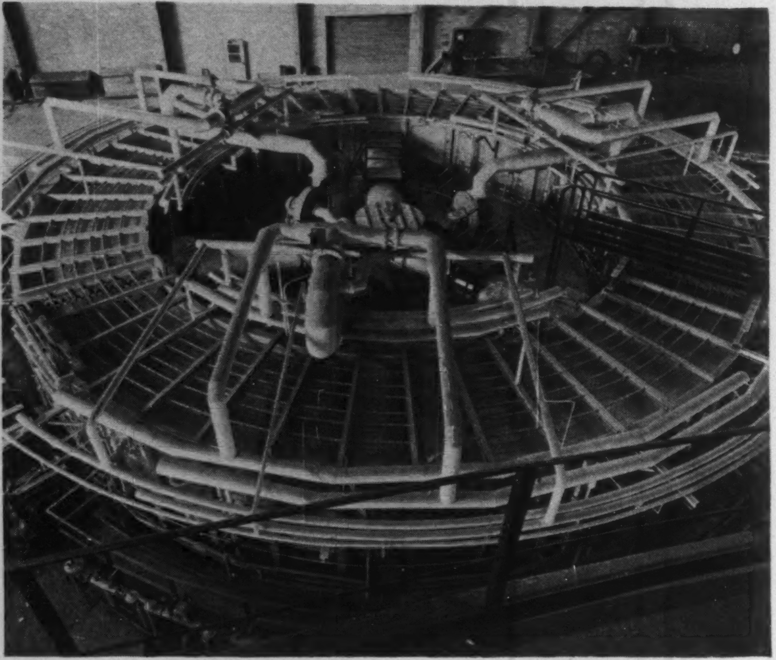
First, there is less on-site labor and less time needed for construction; also, less surplus and waste of materials. Hand-in-hand with this system comes greater use of mass production and high-level "development" areas.

Another reason home builders must cut costs is increasing competition. Prefabricated homes have already captured nearly 20 pct of the market. Mobile homes have another 10 pct and are gaining.

Apartment Era—Then, too, the 1960's are expected to produce an apartment era even greater than that of the 1920's. The increasing number of young married couples and millions of elderly persons will result in the rental boom.

Apartment house construction in 1959 was nearly 250,000 units. This was 18 pct of the nation's total units and three times the post-war low of 82,000 units in 1956.

New Process Means a Higher Grade



FROM LOW GRADE COALS: Salem-Brosius, Inc., and New York Mining & Manufacturing Co. developed this new process for producing high grade coke from low grade coals. The rotary hearth furnace is similar in design to that proposed for producing coke for blast furnaces and chemical processes.

Rail Unions Remain Hostile to Roads

New railroad industry wage agreements haven't made union leaders any friendlier toward the railroads.

A top executive from each side, D. P. Loomis, president of the Association of American Railroads, and G. E. Leighty, chairman of the Railway Labor Executives' Assoc., addressed the Operating Railroad Brotherhoods' Educational Institute at Cornell Univ.

Mr. Loomis called on rail labor leaders to support management in its efforts to get the government to ease its regulation of the industry. All the railroads want is treatment equal to that given other forms of transportation, he said.

Mr. Leighty rejected the plea, calling for more and better regulations. In addition, he indicated that the issue of featherbedding isn't dead. He warns the railroads that "a strike of major magnitude will be inevitable" unless the roads solve the problem of job stabilization.

Reynolds Enters Pact For Greek Aluminum

Reynolds International Inc., a subsidiary of Reynolds Metals Co., is going into partnership with Pechiney, the French aluminum producer, Stavros Niarchos, the shipping magnate, and the Industrial Development Corp. of Greece, to make aluminum in Greece.

The entire operation will be self sufficient. Greek mines will supply bauxite.

Total investment will be $75 million, of which Reynolds will put up 17 pct, Pechiney, 50 pct, Niarchos, 21 pct, and IDC, 12 pct.

For its interest Reynolds will have the right to market 35 pct of the plant's capacity of 52,500 metric tons.

The Greek government has agreed to provide hydroelectric facilities for the project estimated at $85 million.

India's Steel Output Continues to Rise

Steel production in India is expected to reach 2.5 million tons by the end of the year. This will mean an increase of 800,000 tons over 1959.

The growing rate of Indian steel production has caused its imports of steel to drop almost 50 pct during the last two years. The nation now imports about 600,000 tons. The 1958 import figure was near 1.1 million tons.

Arbitration: Will It Be Forced?

Many Washington observers are worried about the drift toward compulsory arbitration in the basic industries such as steel, railroads, and utilities.

They say the nation was never closer to a compulsory arbitration law than during the past session of Congress. They believe the trend will be even stronger in 1961.

What worries these observers is government dictation of terms of settlement in labor-management disputes. Once the government fixes wages, they say, it inevitably will fix prices. As they see it, the acceptance of compulsory arbitration would be the beginning of the end of free enterprise.

Who Gets Patents?

The controversy over government patent practices goes on. Still in question is whether the government or private industry should retain title to inventions developed with Federal tax money.

A Senate subcommittee on patents recently completed hearings on the problem. Testimony backed both positions. No conclusions were drawn by the committee. Meanwhile, private patent surveys are underway. The whole patent controversy will probably come to a head in Congress next year.

Chicago Gear Mfg. Company tames tough steels, cuts costs with STANICUT Oil 208 BCS

Tames tough steels. Gears from one to 300 inches in diameter are machined by Chicago Gear. Steels up to 375 Brinell hardness are worked. STANICUT Oil 208 BCS helps them do it. STANICUT 208 contains maximum amounts of sulfur, chlorine and compounding for handling tough alloy steels. It is viscous enough to stay on tools and work, yet fluid enough for good cooling.

Cuts costs. STANICUT Oil 208 BCS is used at Chicago Gear for all gear hobbing operations and applications requiring a straight cutting fluid. There's no chance of the wrong fluid being used, thus no costly losses. One fluid cuts down inventory, saves time in keeping track of stocks, cuts paper work and ordering.

Gets service. Standard Oil's Dick Erickson is assigned to the Chicago Gear account. With a mechanical engineering degree from Purdue, plus several years' lubrication experience, Dick knows how to help a customer, knows how to supply technical help where it counts. Could STANICUT Oil 208 BCS and Standard Oil technical service help you? Ask about them at the Standard Oil office near you anywhere in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

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You expect more
from Standard
and you get it!

Quick facts about
STANICUT Oil 208 BCS

- Contains maximum amounts of sulfur, chlorine and compounding.
- Viscous enough to stay on large tools; fluid enough to flow easily, give good cooling.
- Can be used straight or diluted.
- Will not separate, become rancid or develop deposits.
- Non-irritating, non-corrosive, non-toxic.

Chicago Gear president Bob Weber (right) and Standard's Dick Erickson talk over cutting oils in front of company's new Pfauter P-2500 gear machine. Machine uses only STANICUT Oil 208 BCS cutting fluid.

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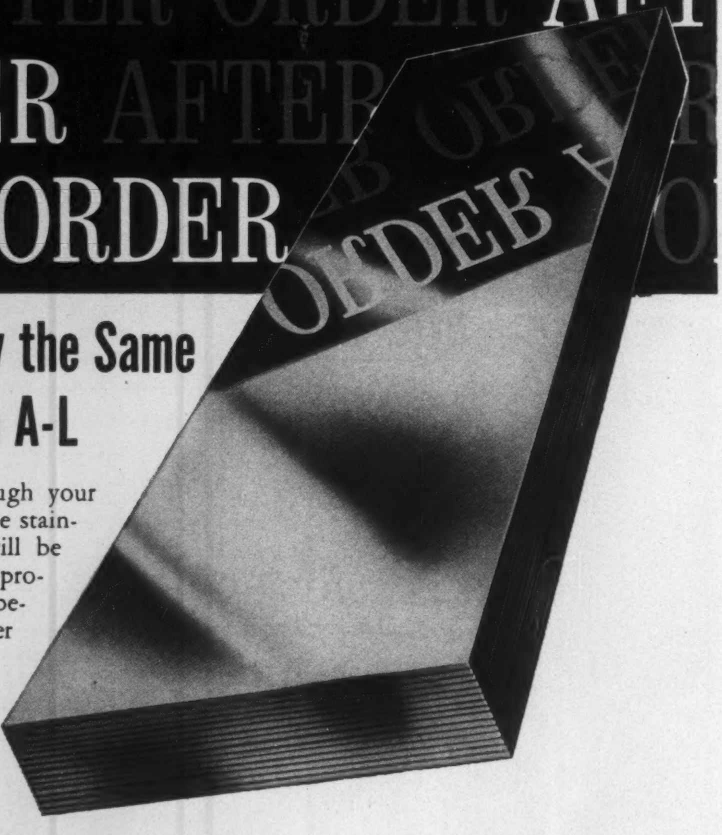

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1718

What Buyers Hope Will Happen

Two factors may decide how active consumers will be in the months ahead.

Right now buyers have doubts, but trend to pessimism noticed earlier this year has stopped spreading.

▪ How much push will the consumer give the economy in the months ahead?

A lot depends on the answer to two questions: Will consumers be pleased with the price tags they find on the things they want to buy? And will business stay strong enough to prevent further employment layoffs, reduced working hours, and other disappointments with personal finances?

Some Doubts — These are the opinions of the University of Michigan's Survey Research Center after its latest poll of consumer attitude and desire to buy. Interviews made in August show the downturn noticed in consumer sentiment earlier in the year has halted.

But there has been no decisive change for the better. In the main, the consumer's mood is not pessimistic—it's hesitant.

The August interviews produced a slight improvement in the Center's consumer attitude index (see p. 7). On six key questions about business and buying plans, the index recovered slightly from its level in May. But it was still below that of last February.

When questions about intent to buy autos and houses were added there was an even smaller improvement in buyer optimism.

How They Feel—Opinions about buying conditions for cars and household goods have improved since the spring. This apparently reflects the buyer's favorable reaction to current and expected price trends. But people's attitudes toward personal finances and actual buying are about the same as they were in May. And concern about general business trends has increased.

Here's what the survey revealed on specific questions:

About Business Conditions: Uncertainty and pessimism have increased since February. Basically the consumer finds good news about the economy lacking. More people than in May 1960 and many more than in May 1959 judge business is worse than it was a year earlier. There are more comments that "business is not good," "unemployment is high," and "people aren't buying."

But doubts about the short-term outlook haven't hurt people's hopes for the long-term outlook. Opinions on five-year business prospects show little change since May 1959. Apparently some consumers are convinced, after the 1958 recession, that the pattern from now on will **not** be continuous prosperity. It will be prosperity interrupted by occasional recessions.

About Market Conditions: Opinions about the market for household goods and cars have improved in the last few months. Notions on the housing market have also bettered to a smaller degree. Best explanation, according to the survey: There's less fear that prices will rise in the coming year.

Debt Rate Will Slow Down

▪ Consumer debt will keep growing in the years ahead, but at a slower rate.

That's the opinion of an economist who's made an intense study of consumer installment credit. He's Professor James C. T. Mao of the Univ. of Michigan's School of Business Administration.

Below 10 Pct? — Prof. Mao points out installment credit increased at an average rate of 10 pct a year in the last forty years. But he predicts the average increase may be only 7.3 pct in the next ten years. By 1970, repayments on installment debt may equal 14 pct of personal disposable income. That would compare with the present 12.9 pct.

The total amount of consumer debt for cars and other durables may double in the 1960s, according to Dr. Mao. Installment credit could pass $80 billion by 1970, contrasted with just under $40 billion at the end of 1959.

One Fourth for Cars—About 25 pct of the increase will be used to finance purchases of cars, he predicts. That estimate is based on the assumption that four out of five households will own cars, compared with the three out of four today. In addition, one household in five is expected to own at least two cars.

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The Business Issues

The Republican Viewpoint On:

★ Economic Growth ★ Taxes ★ Productivity

★ "Tight Money" ★ Foreign Competition

★ Labor ★ The Technological Race

An Exclusive IRON AGE Interview with **Charles H. Percy,** Chairman of the Republican Platform Committee

Differences over the roles of business and government are threaded throughout almost every major issue in the 1960 presidential campaign. In a future issue The Iron Age will present the Democratic approach.

In this interview with managing editor, E. C. Beaudet, the Chairman of the Republican Platform Committee, Charles H. Percy, presents his party's view on the business issues in the 1960 presidential campaign.

■ **Q. Mr. Percy, what do you consider the major business issue in the 1960 presidential election?**

A. Gaining a high level of economic growth in a climate created by government that emphasizes initiative. Initiative, investment, productivity and efficiency are the mainsprings of economic growth, not force feeding through massive, new federal spending.

I would perfer not to pick out an arbitrary percentage as our national economic growth objective. A free economic system simply doesn't work that way. A man does not grow to intellectual or physical maturity at a fixed rate. Intellectually, he advances in spurts as he gains new knowledge and experience and reaches for higher plateaus. An economic system in a free society operates much the same way.

The best means ever devised to plan and organize the production we want is through private initiative exercised in competitive markets. Our objective is to find the best means of fostering economic growth by stimulating individual and private initiative.

■ **Q. The Democratic Party charges that the Republican Administration's "tight money" policies and close credit controls have not kept prices down and have brought on business recessions. How does the Republican Party answer this charge?**

A. The Federal Reserve System and the Administration through the Treasury Department have not uniformly maintained a "tight money" policy during the past eight years. In fact, an "easier money" policy was adopted by the Administration in 1953-54, again in 1957-58 and is **now** in effect.

It is only fitting that excessive use of credit does not add to price inflation during times of full employment. And it's equally fitting that action be taken in the other direction when the situation calls for it.

Now, there is room for argument that the use of these regulatory policies is more an art than a science. Our objective should be to improve the timing and degree of adjustment. By making these adjustments as early as possible during periods of change, the less drastic and more effective they will be.

The interest rate is one of the most important control

Platform Builder: As president of Bell & Howell Company, Charles H. Percy is a strong believer in businessmen taking a more active role in national affairs. He brought business and political knowhow to bear in heading up the 1960 Republican Platform Committee.

"Creative depreciation . . . can create more jobs."

★ **Q. The Republican Party platform calls for a program of broadly-based tax reform. Just what areas does this cover? And what does this mean to business?**

A. Where the tax system works against capital accumulation, where it gives unequal advantage to individual industries, where it limits initiative and reduces incentive, where it penalizes unduly, and where it erodes our capital base—these are the places for reform.

Of course, it was not the province of the Republican Platform Committee to write specific legislation. However, my personal feeling is that the following two areas call for careful review: Depreciation and capital accumulation.

Our tax laws are still too rigid and restrictive in the treatment of depreciation.

Here's an example of what I mean. Not too long ago I visited a 110-year old Swiss company because I was impressed with its ability to turn out low-cost, quality products for world markets.

The company's plants, employing several thousand production workers, were all relatively new and ultramodern. Its production equipment was the most advanced available in Europe and the U. S.

I asked the head of the company how he could afford such a heavy capital investment. He told me he couldn't afford not to. Swiss law permitted him to write off buildings at 15 pct a year and fully write off machine tools in the first year, if he cared to.

This admittedly extreme depreciation schedule accounts for growth, progress, innovation and full employment in Switzerland. Liberal depreciation laws have also encouraged economic growth in West Germany and other Western European nations.

While this has been going on, America's industrial plant has been growing progressively older, on the average, for the past 50 years. One third of American capital equipment is obsolete.

Creative depreciation policies, beyond the improvements made in 1954, can step up our rate of investment, improve our efficiency, reduce costs, and create more jobs by making American products more competitive in world markets.

Now for my second point of the tax question: Capital accumulation. It's more difficult today than ever before to save—to accumulate the means for creating more capital. But in an economy that depends on private capital there must be no barrier to individual and business savings because they are the fountainhead for investment.

To enhance the potential for increased savings, corporate income taxes, particularly in regard to new corporations, should be reformed. Another avenue to higher savings lies in a revision of individual income taxes through averaging and through spreading tax rates lower than the present 20 to 91 pct bracket.

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devices in the American economy. If we are to achieve a sound economic growth, savings and investments must be based on an interest rate which realistically reflects money market conditions. This means a rate that regards interest as both an **income** and a **cost** and which gives a **value** to capital which is in keeping with the value attached to other resources.

The years of the Eisenhower-Nixon Administration have been for the most part years of high economic activity. On the whole, the Federal Reserve and Treasury Department policies have met the needs of the economy.

With respect to prices, in almost eight years of the Eisenhower-Nixon Administration (1953-1960) the consumer price index has moved up 10 pct. This compares with a 47 pct leap in the previous eight years.

Republican monetary policies have brought remarkable stability to prices, particularly in the case of food. Here, the last eight-year increase has been 6.6 pct. In the eight years before, food prices soared 63 pct.

Also, keep in mind that the setbacks of 1946 and 1949 caused drops in the gross national product which were 50 pct larger than those of 1954 and 1958. Price stability and the intelligent control of money and credit during the Eisenhower-Nixon Administration have provided a sound base for the economy as it moved beyond the half-trillion dollar level.

■ **Q. Some American industries, particularly in metalworking, are suffering from imports of lower-priced foreign goods. What does the Republican Party offer as a means of correcting or at least alleviating this situation?**

A. Reciprocal trade treaties, that are truly reciprocal, were advanced by the Republican Party over 50 years ago. The 1960 platform advocates further application of this policy with due concern for severe adverse effects on domestic industry and labor. Wise use of the "escape clause" and "peril point" provisions in tariff regulations is strongly recommended.

In the same area, the Republican Party platform calls for the encouragement of fair labor standards in exporting countries to assure fair competition in international trade.

Efforts to expand and open foreign markets and reduce discrimination against American goods abroad should also be encouraged. One plank in the 1960 Republican Platform favors relating wages and other

"Higher wages . . . should be more closely related to gains in productivity."

wage costs in production to productivity, to help us stay competitive at home and abroad. When wages go up without corresponding increases in productivity, we lay ourselves open to foreign competitors.

Another platform plank calls for the elimination of featherbedding practices. Cost reduction, methods improvement and increased mechanization are further steps necessary to keep America ahead.

■ **Q. What actions does the Republican platform suggest for improving the welfare of both organized and unorganized workers? And how should the "proceeds" from increased productivity be divided?**

A. The Administration record in this area is exceptionally good. The country has had a remarkable record of labor peace despite the steel strike last year. Time lost through strikes so far in 1960 has been only slightly more than one hour in every thousand available working hours, a near-record low.

The best thing in the world for labor, just as for business, is a government which checkmates abuses and keeps the pendulum from swinging too far either way.

Specifically, the Republican Platform calls for: Increased levels and expanded coverage of minimum wages; continued improvement in training of workers displaced by technology; assistance in finding jobs for workers displaced by shifts in the economy or by advancing automation.

As productivity rises, management will be continuously faced with the challenge of fairly and equitably distributing the gains. Share-owners, workers, customers and government have a claim on the proceeds of American industry. How the increases should be distributed as dividends, as increased wages or as lower prices will be a continuing question.

Productivity gains come from the tremendous capital investment American industry makes every year. Part of the productivity gains belong to the people who provide the capital. The American worker's productivity also increases as his skills, his knowledge and his experience grow. A share rightfully should go to him. And the consumer has a right to expect more for his money. As profits increase, the government's share through tax revenues is automatic.

I cannot overemphasize the fact that higher wages and benefits should be more closely related to gains in productivity. To do otherwise would be inflationary and continue to put us at a disadvantage with foreign competitors.

Keep in mind that, today, shrinking profit margins are a major problem facing American industry. If profit margins shrink further because of narrow labor union policies; or because of management's inability to change and look ahead; or because of short-sighted government policies; there won't be enough profits left to argue about how they should be divided. And there won't be enough left over to finance sound economic growth to increase job opportunities.

■ **Q. What program does the Republican Party platform suggest which will bring about closer harmony between management and labor and at the same time be in the best interests of all citizens?**

A. We must maintain free collective bargaining untrammeled by government intervention, except in extreme cases of national emergency. Government offices of mediation and conciliation should be strengthened where needed, but government intervention must be at a minimum.

But a political party can also assist in achieving better understanding of the respective roles of labor and business by the general public, by public office holders and by each other. Government policies affecting business must rest on a clear understanding of the part business plays in achieving military security and economic progress. It is through effective business organization that America deals with the basic economic problem in both these areas—that of applying limited resources to unlimited needs.

For a long time it has been fashionable for many politicians to denounce business. The critics appear sometimes to question its whole moral foundation, sometimes the success of those who have risen in its ranks. Because this attitude can shrink opportunity for the American people and slow down economic progress, it is important to recall what business really is.

Business is the way we, as a people, generation after generation, have organized ourselves to carry on economic activity. It is the way we create jobs in America. It is the way employees, managers, investors and customers are brought together to produce and distribute the things our people want and need.

It is also the way millions of Americans have been aided in meeting the problems of personal security through employee benefit programs. To produce complex weapons for defense in the space age, to supply new and better goods for family living, to increase personal security and to provide greater opportunity—our people look first to business, not government.

■ **Q. The United States is in a technological race with Russia and its Satellites. Yet the Republican Party platform advocates the decentralization of research activity. Wouldn't it be better for the federal government to control as much of this activity as possible?**

A. Research must have a free climate, an unfettered atmosphere, in which to work and thrive. Scientists themselves want no centralized control and feel the need for decentralized and competitive effort. Now, some say that competition in research means duplication in research effort and expenditures. A certain amount of duplication does occur, of course. But the answer does not lie in a vast government program to coordinate the national research effort. Duplication is part of the price of freedom in a competitive economy.

Remember, the government can tap the research facilities of most every university and industrial company in the country. There are thousands of highly specialized research laboratories in industry, in the universities and in the various privately endowed research institutes. These are a great national resource and are available to the government for any project.

There should be adequate incentive for companies to do research for the government. As a byproduct of this research, sometimes benefits are derived in the form of commercial products which generate employment, profits, and increased productivity.

In these cases, it has been said that government is paying for scientific discovery and, therefore, the fruits of scientific knowledge belong to the people. The dividends of scientific advance **should** go to the people, but the people are more likely to get the full measure of these dividends through competitive enterprise than through government operation. This has been the history of the American economy and why our people enjoy the highest living standards.

■ **Q. In what areas does the Republican Party feel that the federal government should take an important part in research activities?**

A. The major role of the government is in the support of basic research being conducted privately. To assure that public funds for basic research are expended in the public interest, a national agency and national advisory panels should be set up to evaluate each area of research and recommend appropriate support.

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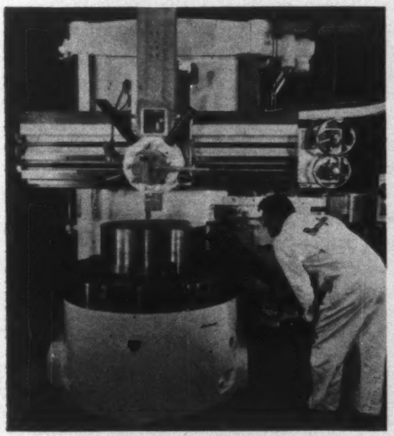
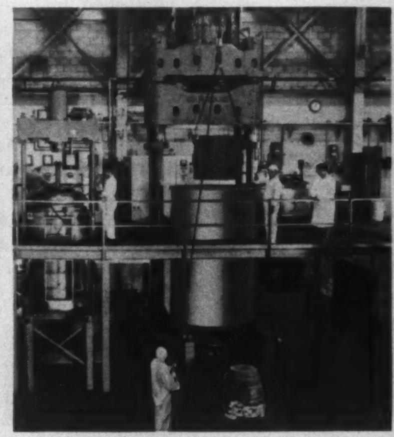
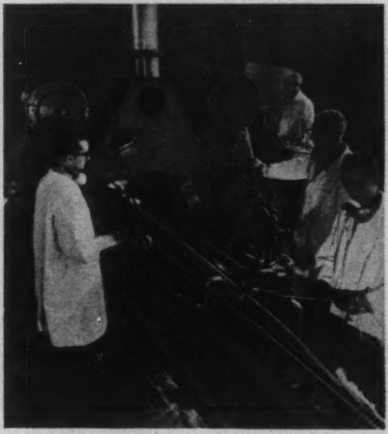


Extensive machining facilities at Berylco's Hazleton plant turn out precision beryllium metal components.



Various shapes and forms of beryllium metal are produced at Berylco by advanced powder metallurgy methods.



1700-ton Loewy hydro press at Berylco's Reading plant extrudes beryllium metal and alloys.

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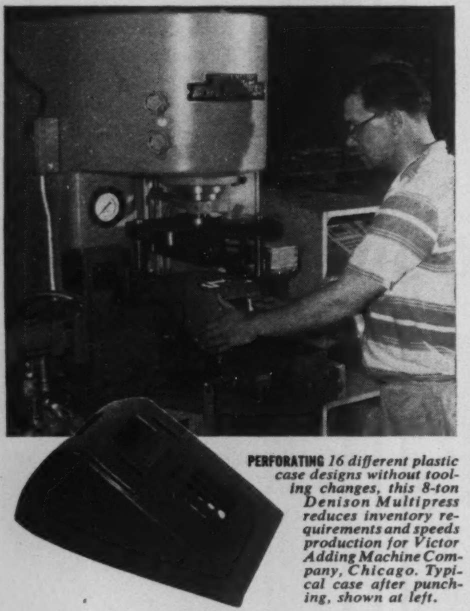
16 different VICTOR ADDING MACHINE cases perforated without tooling changes, demonstrates DENISON Multipress...

VERSATILITY



PERFORATING *16 different plastic case designs without tooling changes, this 8-ton Denison Multipress reduces inventory requirements and speeds production for Victor Adding Machine Company, Chicago. Typical case after punching, shown at left.*

SHARPLY REDUCED inventory requirements, no scrap loss and production line versatility are just 3 of the important advantages gained with this Denison hydraulic Multipress at Victor Adding Machine Company.

Previously, stocks of at least 6 different basic plastic shells had to be maintained to produce cases for 16 different models in the Victor Champion line.

Now, with an 8-ton Multipress equipped with special tooling and controls which enable the operator to select a variety of punching combinations automatically, only *two* basic shells are required in stock. And *all* of the 16 different case design variations are perforated on the Multipress *with no change of tooling*. And the right shell is always on the assembly line at the right time.

Smooth, controlled hydraulic power perforates the "Cycolac" plastic, without charring or discoloring. Holes are clean and smooth . . . there's no scrap loss . . . punch life is significantly longer. This operation at Victor Adding Machine is another case-in-point showing how Multipress versatility and usefulness can save time and money in *your* plant. Call in the nearby Denison Production Specialist to discuss how a **M**ultipress **A**nalysis **P**rogram can start to **MAP** production savings for you now.

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Is Grease Job on the Way Out?

Cadillac Offers Greaseless Cars, Others Consider It

1961 Cadillacs will never need lubricating. New front suspension, rubber bushings, special lubricant and seals are being used.

Now other automakers are also studying the possibilities. Ford's Lincoln Continental may be greaseless too.

—By A. E. Fleming.

▪ The latest step toward greaseless cars will be taken by Cadillac this fall. The prestige division of General Motors Corp. has eliminated chassis lubrication on 1961 models.

There were 17 spots that had to be lubed at regular intervals on 1960 Cadillacs. The 1961 chassis has none. Reports are Ford Motor Co.'s high-price field competitor, Lincoln Continental, will also do away with grease jobs on 1961 cars but details are unknown.

Trick behind Cadillac's ability to get rid of lube fittings is a new front suspension design, use of rubber instead of metal bushings, a special lubricant and high-quality seals.

Rubber for Metal — Suspension arms of 1960 models were joined to the car frame through metal-to-metal steel bushings. In their place are rubber bushings of high tensile strength which also act as road noise isolators. So complete is the insulation, insist Cadillac engineers, that copper bond straps from the suspension to the frame had to be added to keep tire static out of the radio.

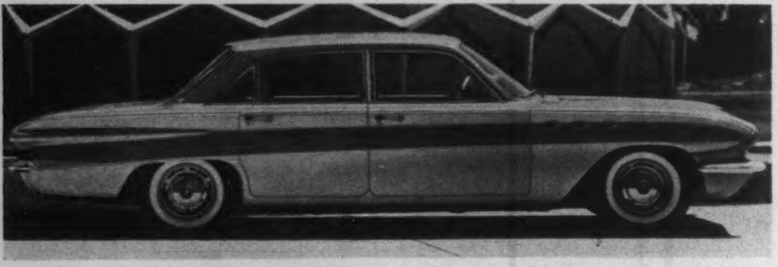
Using rubber bushings on all suspension components to frame attaching points has eliminated the need for lubricating these points. To complete the job, steering linkage and spherical joints are designed also to be lubrication free.

Spherical joints used on the suspension system and steering linkage are packed with a special lubricant and closed off with a neoprene seal at assembly. As long as the

New Size, Curves and Price

THREE FEATURES: Oldsmobile's new F-85 (top) is among the new entries in the compact field. It's 188.2 in. long with a 112-in. wheelbase. Pontiac's Vista hardtop in the 1961 Bonneville series (center) has curving windshield pillars and features the Trophy V-8 engine with four barrel carburetor. From Chrysler's new, lower-priced Newport two-door hardtop (bottom), has a 122-in. wheelbase.

Buick's New Compact Special . . .



ALUMINUM ENGINE: Closely resembling larger Buicks (see below), the lightweight Special is powered by an aluminum V-8 engine with 155 hp. It is mounted on a 112-in. wheelbase, is 188 in. long and weighs 2700 lb.

joints aren't disturbed there's no problem.

If the seal does happen to become damaged, the joint can be repacked and the seal replaced at a Cadillac service garage.

Periodic Checks—Only attention 1961 Cadillac owners must give their cars is a change of oil and filter at regular times, and a periodic check of battery, transmission, axle, steering and brake fluids.

Why did Cadillac do away with grease fittings? Certainly not to save customers several dollars a year in lube costs. "Let's say it's a matter of convenience, not cost," says J. T. Hoban, Cadillac assistant staff engineer. There are no more garage delays waiting to get a Cadillac on the grease rack.

Also, the new suspension weighs 10 lb less than the old one, a point in the trend toward lighter cars by all manufacturers.

Now that Cadillac—and presumably Lincoln—have done away with chassis greasing, will medium and low price car makers follow suit? Or is the idea too costly for them to think about?

Not Really Expensive—"There's nothing really expensive about it," says Mr. Hoban. Inference is other car producers could come up with something similar without spending too much.

Inquiries at other companies show they are curious about the development. They have, in fact, been checking out Cadillac engineers on the subject. Some are no doubt busy working on it right now. At Cadillac the system has been 2.5 years in the development stage.

It didn't take too many changes in manufacturing or assembly for Cadillac to come up with the new suspension. New machines were needed to produce steering knuckles and arms. But much of the former machinery is reworked.

Modified Equipment—Engineers modified existing assembly equipment to take care of the change in anchor points. Final assembly fixtures are installed for putting the new assembly on the frame, and subassembly fixtures are altered. It's now simpler to set the front suspension alignment on the assembly line.

What effect will the trend toward greaseless cars have on service stations? Will they need fewer workers or make less money? It isn't likely. Many mechanics consider the grease job a nuisance anyway. It's a task that takes time away from more profitable repair work.

Less Grease to Be Used—Besides, the handwriting has been on the wall for some time. In less than 10 years the number of grease fittings on cars has fallen 50 pct. Estimates are that grease consumption, somewhere around 100 million lb a year now, will drop well below 50 million lb a year within the next five years.

Cadillac has no intention of entering the smaller car field. Referring to such rumors, H. G. Warner, division general manager, notes: "Apparently we at Cadillac are misinformed on this because we have only the standard size Cadillac in our lineup this year and in our plans for the future."

To Fit Garages — Perhaps the rumors stem from the fact that in a few months the division will offer a six-window sedan which has seven-in. chopped off the rear deck. It will be built for some Cadillac owners who've been complaining their garages can't hold a longer car.

. . . Resembles Its Big Brothers

A BIT SHORTER: The 1961 Buick LeSabre is mounted on a 123-in. wheelbase and has an overall length of 213 in., almost 5 in. shorter than last year. The new turbine drive transmission is standard in LeSabres.

Furnace value comes in a variety of boxes at North American

North American Aviation, Inc., Los Angeles, had three separate heat treating operations. Each called for special equipment. Hevi-Duty met each with a box furnace that was quickly adapted for the specific job.

This illustrates two important points. 1. You need never alter a good system to fit the equipment. Hevi-Duty engineers are qualified to recommend entire heat processing systems and to design the equipment to fit each one. 2. In most cases this can be done with a minimum of engineering time. For Hevi-Duty builds the most complete line of fuel-fired and electric furnaces and ovens in the industry. If an adaptation is necessary, it usually is a minor adaptation from a proven unit.

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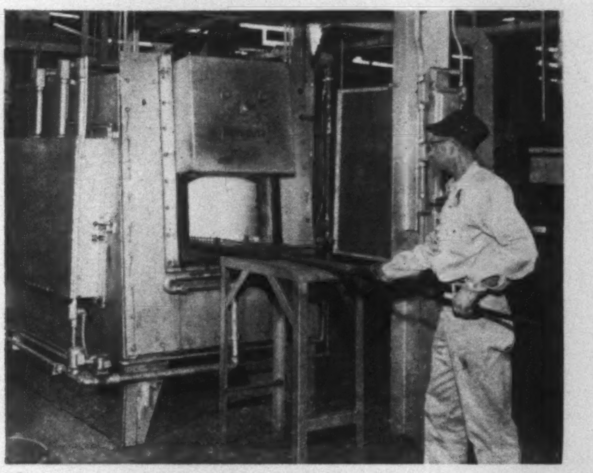
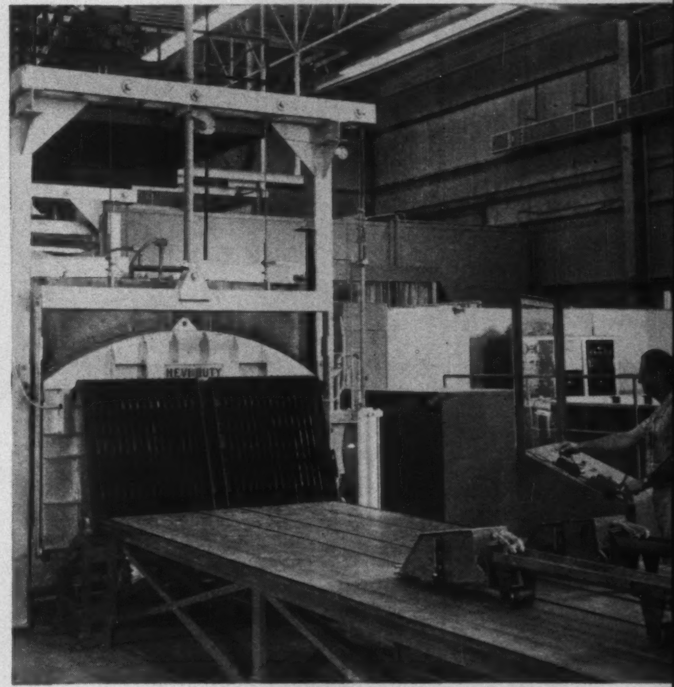
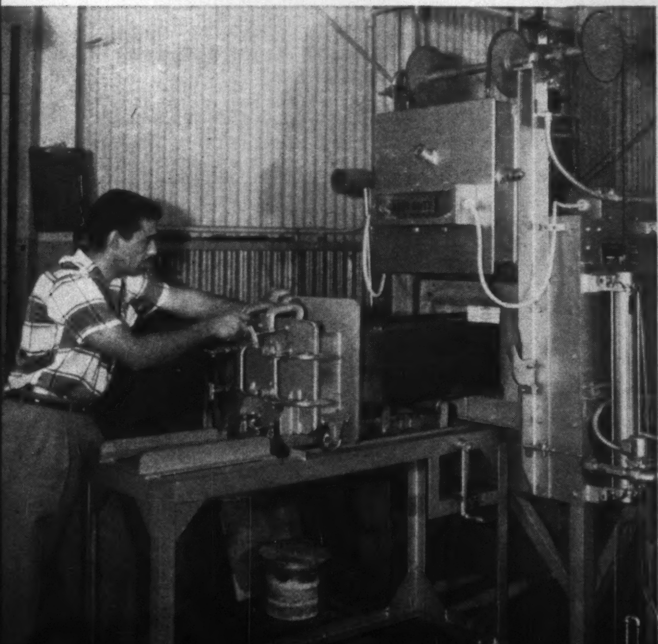


▲ This box furnace was designed to handle copper brazing and heat treating in an endothermic atmosphere. Its water-jacketed cooling chamber and oil quench tank are atmosphere-protected. There are door curtain burners at each end. North American reports it is getting exceptionally clean work from this furnace due to the enclosed quench. ***For complete information ask for Bulletin No. 153.***

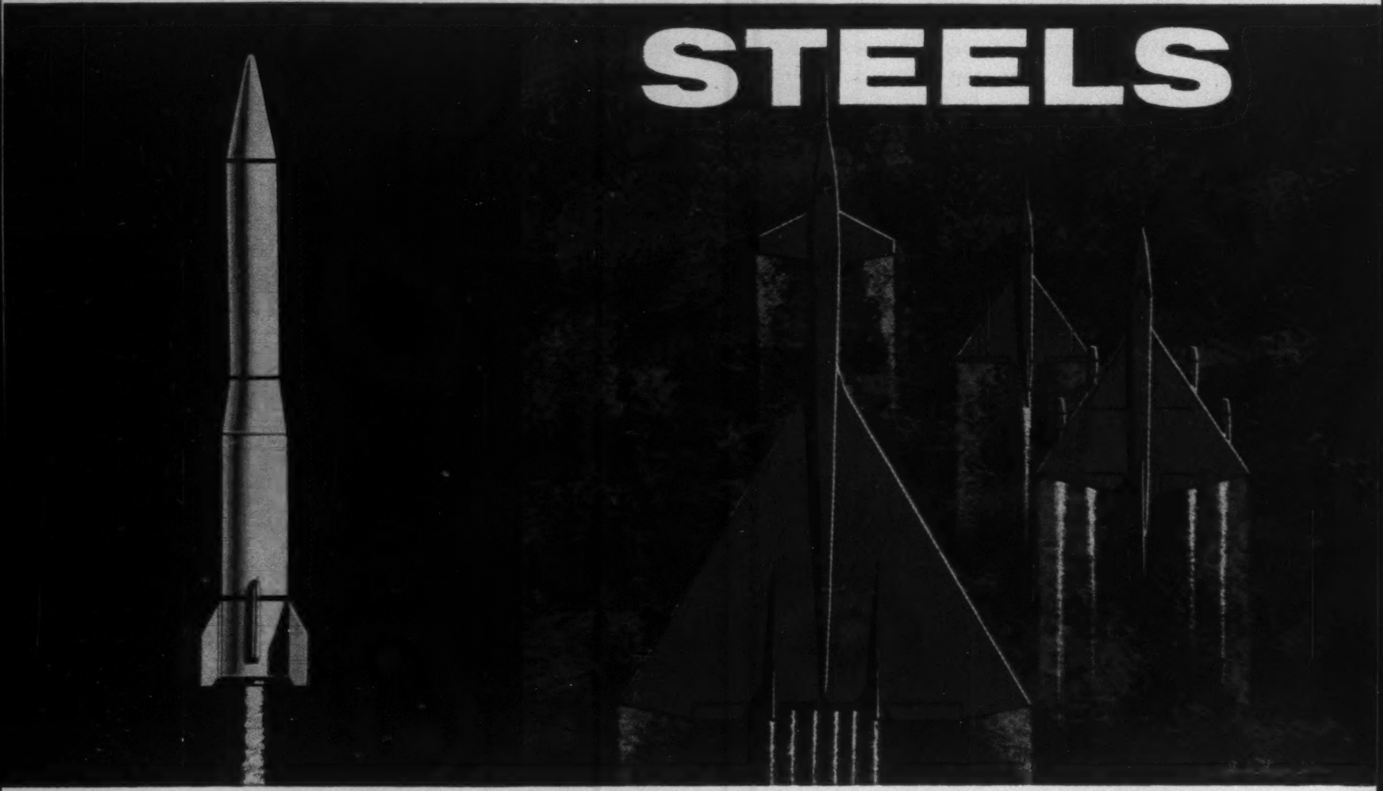


▲ This 280-kw box furnace is used for brazing stainless steel honeycomb sheets. It has been equipped with automatic feed and discharge, air-operated doors, and three separate zones of control. Even without a fan, this furnace has been certified at ±10°F. at 1600°F. ***Request Bulletin 441A.***



◀ It takes real versatility to handle the jobs this furnace is required to do. Used for experimental work in the heat treating laboratory at North American, the furnace operates in a range from 250°F. to 2200°F. with all types of atmospheres. Temperature uniformity is reported at ±10°F. over the entire range. A removable fan enables convection or non-convection heating. The furnace can be used with an air-operated door or with a retort and plug-type door on a movable stand. ***Ask for Bulletin 1046A.***

VANADIUM-ALLOYS CVM CONSUMABLE VACUUM MELTED STEELS



from the world's most modern ultra-high vacuum melting furnace

Cleaner, tougher, stronger steels fit for the meticulous specifications that frame today's new uses on earth, in air or in space—steels that perform beyond all previous standards because of Consumable Vacuum Melting, under precise control. • Every *First Quality* Vanadium-Alloys steel is a finer steel when CVM processed: the table at right is typical. If your application requires the utmost from a specific grade, the moderate extra cost of CVM will prove a sound investment. *Let us go over the facts with you, at your convenience.*

CVM GRADES NOW AVAILABLE

VASCOJET 1000
AMS 52100
AMS 51100
STAINLESS 440 C
STAINLESS 440 C MODIFIED
D6-AC
AISI 4340
AISI 4350
A286
STAINLESS 430
AMS 6434
VASCO M1
VASCO M2
VASCO M10
VASCO M50
STAINLESS 410
INCO 901
300 M
AISI 9310
STAINLESS 316
STAINLESS 317

Special compositions of any kind will be made to customers' requirements.

What CVM does for a fine air-melted steel: VASCOJET 1000

EFFECT OF CONSUMABLE ELECTRODE VACUUM MELTING ON TRANSVERSE DUCTILITY OF VASCOJET 1000 AT 280-310,000 PSI

Representative billets and bars from multiple heats. Four to six tensile bars cut transversely from midradius of each piece and heat treated to 280-310,000 psi ultimate tensile strength.

Cross Section	Avg. Transverse Reduction of Area (280-310 ksi) Consumable Vacuum Melt	Air Melt
16″ square	21%	7%
12″ square	22	10
9½″ round	27	11
9″ square	30	11
7″ round	31	12
7″ square	35	12

VANADIUM-ALLOYS STEEL COMPANY

GENERAL OFFICES: LATROBE, PA.

DIVISIONS: Anchor Drawn Steel Co. • Colonial Steel Co. • Metal Forming Corporation • Pittsburgh Tool Steel Wire Co. • Vanadium-Alloys Steel Co.

SUBSIDIARIES: Vanadium-Alloys Steel Canada Limited • Vanadium-Alloys Steel Societa Italiana Per Azioni • EUROPEAN ASSOCIATES: Societe Commentryenne Des Aciers Fins Vanadium-Alloys (France) • Nazionale Cogne Societa Italiana (Italy)

50th Anniversary
FIRST QUALITY
VA
TOOL & SPECIAL STEELS
1910-1960

Is Supersonic Jetliner Near?

Research on Military Transport Now Underway

Prospects for a faster-than-sound passenger plane are improving.

Air Force is already studying a supersonic transport. If OK'd, Farwest planemakers will probably get contract for the job. —By R. R. Kay.

▪ Behind the scenes, there's a battle raging over supersonic transports. The fight seeks to settle who will build this country's—and possibly the world's—first faster-than-sound passenger plane.

The battlegrounds are many: Congress, the Federal Aviation Administration, the Pentagon, and airline front offices.

Military Study—The U. S. Air Force recently started a study program on a supersonic transport for military use. Eight airframe makers were invited to give their ideas. Six of these are headquartered on the West Coast: Boeing, Convair, Douglas, Lockheed, North American, and Northrop. The other two are McDonnell and Republic.

If the Air Force goes ahead with the supersonic transport, it's a solid bet that one of the West Coast companies will get a large contract. Several of the firms may team up, along with an engine maker, to do the job.

Cost Estimates—The tab for a supersonic prototype could run to $1 billion. But some experts say that it can be done for $250 million.

The Air Force just finished an inspection program of its 2000-mph B-70 bomber. North American Aviation is the prime contractor. The head of the 80-man Air Force group said the inspection "showed the hardware for a Mach 3 airplane can be built and proves beyond doubt the feasibility of the B-70."

In any event, you won't be flying in a 1500 to 2000 mph transport for another ten years. A prototype could be in the air in five years.

West Coast Briefs

The Columbia-Geneva Div. of U. S. Steel will supply about 75 pct of the 300,000 tons of steel for a new giant natural gas pipeline.

Hercules Powder Co., Wilmington, Del., will make the third-stage rocket engine for the Minuteman ICBM at Bucchus, Utah.

A top steel industry executive says, "The construction industry on the West Coast will use slightly more steel this year than in 1959. But manufacturing won't buy more than it did last year."

Rocketdyne Div. of North American Aviation will develop a 200,000 lb thrust rocket engine for National Aeronautics and Space Agency. The contract is for $44 million. It calls for a 4½-year program to advance the hydrogen-fueled engine to flight capability. Work will start immediately.

Flight Load Test for Convair 880-M

DYNAMICS TEST: At San Diego, Convair's 880-M jet airliner undergoes proof load tests before initial flight. Test here is on slats used on wings to make possible shorter landing distances. Air passing over wings goes under slats, making for lower stall speed.

Quality . . . the best economy of all

He's mopping up the mess for the last time

At a leading aircraft research center, high-frequency vibration caused severe oil leakage from hydraulic lines servicing a huge wind tunnel. Many man-hours each month were wasted cleaning up the basement floor underneath, even though drip pans were used extensively.

Now, after a change to a Suntac oil, the vibration-caused leakage has been reduced to a point where "mop-up" is not needed. Hydraulic-fluid consumption has been cut by 4000 gallons a year. That's economy! That's Sun quality—the best economy of all.

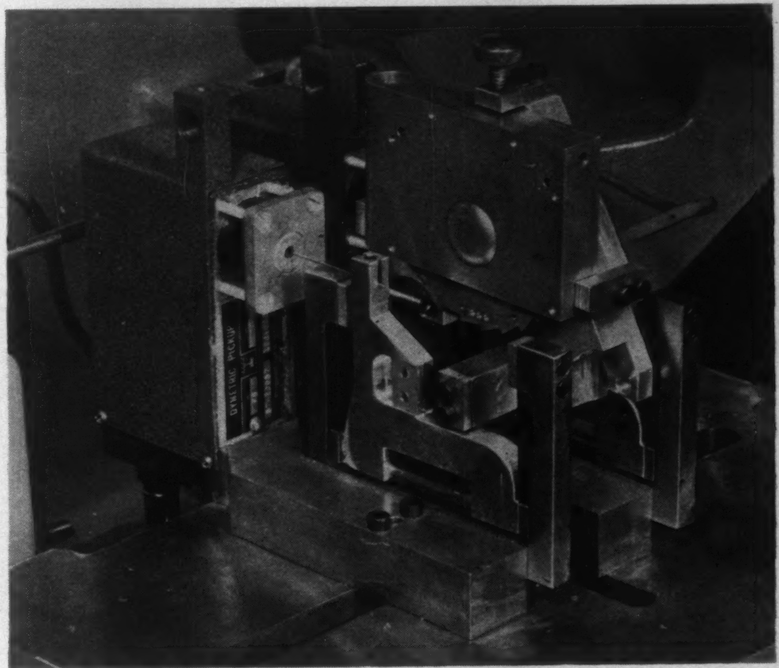
If your plant is troubled with a leaky system, a Suntac antileak hydraulic oil can save you money, too. Ask your Sun representative to show you the Suntac desk-top demonstration, or write direct to SUN OIL COMPANY, *Philadelphia 3, Pa., Dept. IA-9 In Canada: Sun Oil Company Limited, Toronto and Montreal.*

SUNOCO

MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES

Small Parts Gain in Importance

Balancing Plays a Top Role in Manufacture



FINE BALANCE: Toothed wheel is placed in fixture for dynamic balance. Air drives the rotor at steady 8000 rpm. Tachometer scale, and direct reading meters for amount and angle of unbalance simplify the delicate job for the operator.

As the space age continues at a rapid pace, so does the need for small precision parts.

Miniature components for missiles and space vehicles are becoming an important aspect of machine tooling.

—By R. H. Eshelman.

▪ With the trend to miniaturization fanning out through the metal-working industry, small mechanical parts designed to rotate at high speed are reaching critical importance.

Some of these components are armatures, aircraft and missile gyros, small spindles and turbine rotors. Accurate balancing is a vital step in the manufacturing process. Stiff specifications of dynamic balance can cause many a production headache.

But they don't have to.

There are machine designers and builders with experience in dealing with such tricky problems. One of these, Gisholt Machine Co. of Madison, Wis., reports on a case history.

Small Stabilizer—The component is not much larger than an eraser. It is a rolleron gyro turned out by R. C. Allen Business Machines, Inc., Grand Rapids. It's vital to proper operation of the Sidewinder air-to-air missile. In fact, four of the units stabilize the missile in flight. Powered by air flowing over stabilizing fins, a toothed wheel of the unit must revolve at very high speeds. Precision manufacture and balance are required.

To balance the tiny assembly the contractor uses the sensitive dynamic balancing machine along with a miniature, semi-automatic drill press. The latter has micrometer depth adjustments of 0.001 inch.

Close Testing—The balancing unit uses an air drive. It takes only 5 to 8 seconds to accelerate the rotor to 8000 rpm. The test technician takes data from direct reading meters in two correction planes.

For the balancing operation the toothed wheel piece-part is given a light-dark finish. This triggers a photo-type pickup, for angle reference and recording rotating speed through a tachometer. Both amount and angle of imbalance appear on meters.

The operator removes the part and places it in a work support fixture on the correction drill press; sets it up to remove the proper amount of metal in the two planes.

New Machine Offers Close Tolerances

A new numerically controlled point-to-point positioning system has been introduced by Micro-Path, Inc., Los Angeles.

Accurate to 0.0001 in., the positioning system includes a new positioning table on the drilling or milling machine and employs a completely transistorized electronic console for maximum reliability, according to company officials. Movements of 0.0001 in. can be realized without oscillating.

INDUSTRIAL BRIEFS

Press of Business — Pittsburgh Aluminum Alloys, Inc., Murrysville, Pa., completed their facility expansion program with the installation of a new 1500-ton Loewy extrusion press. The new plant is designed and equipped to manufacture custom aluminum extrusions. It formerly produced aluminum extrusion for its own door and window products under the name of B & G Mfg. Co.

New for Old—A diecasting plant for Alcoa is nearing completion on a 76-acre site overlooking the New Jersey Turnpike, near Edison, N. J. It will also serve as a dramatic showcase for aluminum building products. The plant is scheduled for occupancy in October. It is being erected to replace the 38-year-old die-casting plant in nearby Garwood.

Corporate Image—On October 3 The American Brass Co. will officially change its name to Anaconda American Brass Co. It is one of the nation's largest copper and brass mill manufacturers. Since the end of World War II there has been a decided trend in the company's business toward advertising, marketing and packaging their goods under the brand name "Anaconda."

Resin Pellets—A new General Electric Co. plant for polycarbonate plastics opened in Mount Vernon, Ind. It culminates an $11 million expenditure for research, development and facilities. GE's new facilities can initially produce in excess of 5 million lb of Lexan resin, mostly in pellet form, each year.

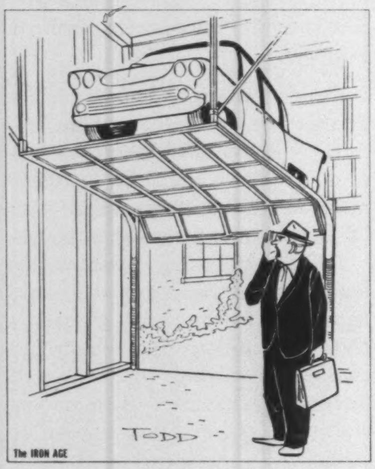
Webb Wire — The Webb Wire Div. of The Carpenter Steel Co. is planning to build a modern wire drawing mill. The new plant will be located on a 6-acre tract in North Brunswick Township, N. J. Work is scheduled to begin on the facility October 1, with completion expected in February, 1961.

Atoms in Illinois — The Commonwealth Edison Co.'s nuclear power station will be dedicated on Oct. 12 at the station site on the Illinois waterway, 50 miles southwest of Chicago. The $51 million Dresden Station went into test operation on April 15, when it produced its first electricity. It achieved full power on June 29.

Howe to Refine — Howe Sound Co., acquired the Combined Smelting & Trading Corp. of Sewaren, N. J. It will be carried on under the name of Howe Refining Corp. The corporation will perform the function of the nonferrous department of Frank Samuel & Co., a division of Howe Sound Co., which handles nonferrous metals and scrap.

Thin Tin—Granite City Steel Co. plans to produce both standard and very thin gauges of tinplate on a 6400 hp Sendzimir cold-strip mill. This mill is now being built and will go into production in the second quarter of 1961.

Heat Expansion—Two new furnaces at The H. M. Harper Co., Morton Grove, Ill., will heat treat much longer extruded shapes and rods. It will also increase its capacity of annealing coiled wire. The furnaces are part of the company's $1.2 million improvement and expansion program started last year.



"I said, where did you park last night? I'm late for the office as it is."

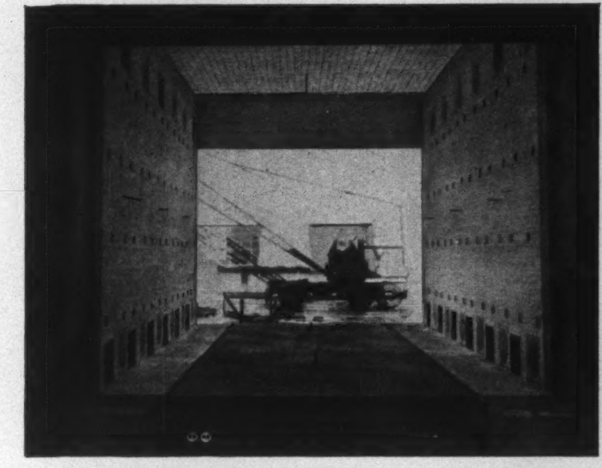
Urban Renewal—Reynolds Metals Co. started construction on its first urban renewal project. It is a $4 million development of modern apartments and townhouses in Cincinnati. The company has also been awarded renewal projects in Philadelphia, Washington, D. C., Kansas City, Missouri, and Kansas City, Kansas.

Expand in the Andes—Cerro de Pasco Corp. plans to spend $6.8 million for plant additions in Peru. The electrolytic zinc plant at La Oroya is to be increased in capacity from about 32,000 to 52,000 short tons of special high grade zinc a year. The concentrator at Cerro de Pasco, in central Peru, is to be expanded to accommodate increased volume of copper ore and lead-zinc ore to be mined by open-pit methods.

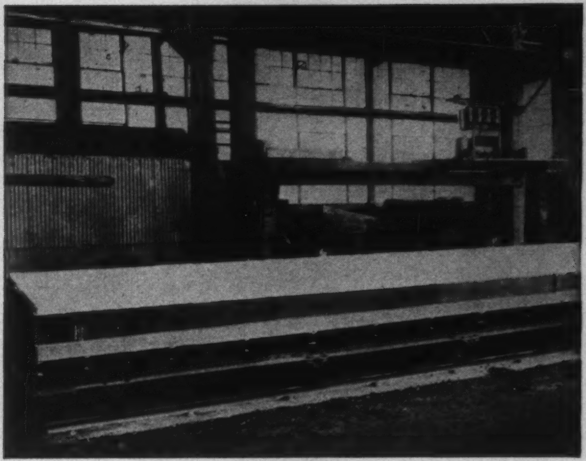
Gray Head of Miners—J. C. Gray is the new president for 1961 of The Society of Mining Engineers, a constituent organization of the American Institute of Mining, Metallurgical, and Petroleum Engineers. He is administrative vice president, raw materials of U. S. Steel Corp., Pittsburgh. Mr. Gray will succeed Dr. A. B. Cummins on Feb 28, during the annual meeting of AIME in St. Louis.

Tube Change—The Welded Steel Tube Institute, Cleveland, is the new official name of the Formed Steel Tube Institute. Among its members are divisions and subsidiaries of American steelmaking corporations engaged in manufacturing tubing formed and welded from flat rolled steel, both carbon and stainless.

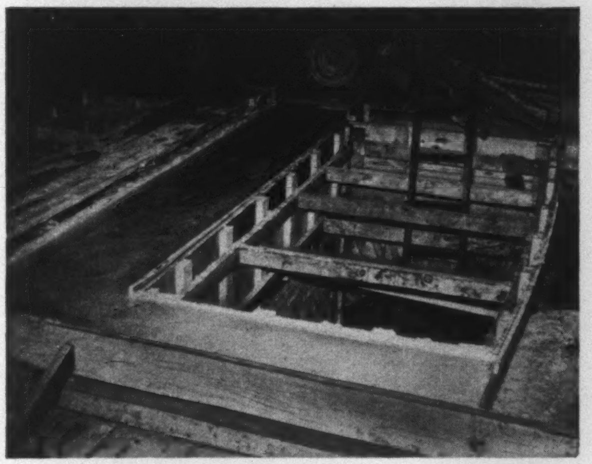
Slitting Room—General Electric Co. has delivered a power control room to Armco Steel Co. The control room will operate a 73-inch pull-through slitting line at Armco's Middletown, O., Works. It's custom design will save on normal installation costs for such control and is engineered to fit around existing building columns in the plant.



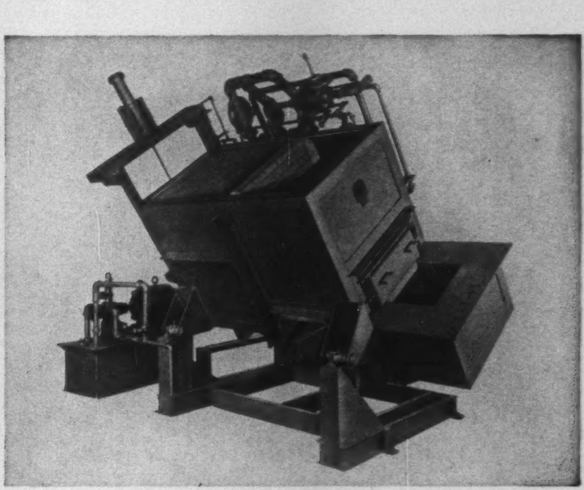
In this stress-relieving furnace, B&W Kaocrete-D is used on the floor ledges, car top, in the door jamb and at the end of the flat roof where it withstands the abrasion of the door. This material is specially designed to withstand severe abrasive conditions and mechanical abuse.



Heavy duty car top service requires a high strength castable. B&W Kaocrete-D is excellently suited for this service at temperatures to 2500 F. B&W Kaocrete-32 is recommended for service above this range.



B&W Kaocrete-32 has been cast to form the curb walls of a soaking pit. When mechanical abuse from ingots damages the curb, Kaocrete-32 has the necessary properties to localize the damage, thus maintaining the serviceability of the rest of the curb.



The castable lining of this aluminum reverberatory furnace must have unusually high strength to withstand the considerable physical abuse of charging, operating and cleaning, while resisting the penetration of the molten metal. Kaocrete-D is widely used in this application.

How B&W refractory castables solve abrasion problems

Refractory castable linings used in metal-working furnaces are often subjected to severe mechanical abuse. Scraping by hand tools, loading and unloading, and the action of the molten metal and particle-laden gases all affect the life of refractories. Among B&W's line of refractory castables are two that are particularly suited to withstand unusual abrasive conditions. They are B&W Kaocrete-D and B&W Kaocrete-32, both of which have been used successfully in many demanding applications.

B&W Bulletin R-35A gives additional information on versatile B&W refractory castables. Write for copy to The Babcock & Wilcox Company, 161 East 42nd Street, New York 17, N.Y.

R606R

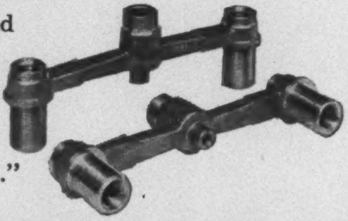
B&W

THE BABCOCK & WILCOX COMPANY

REFRACTORIES DIVISION

B&W Firebrick, Insulating Firebrick, and Refractory Castables, Plastics, Ramming Mixes, Mortars, and Ceramic Fiber.

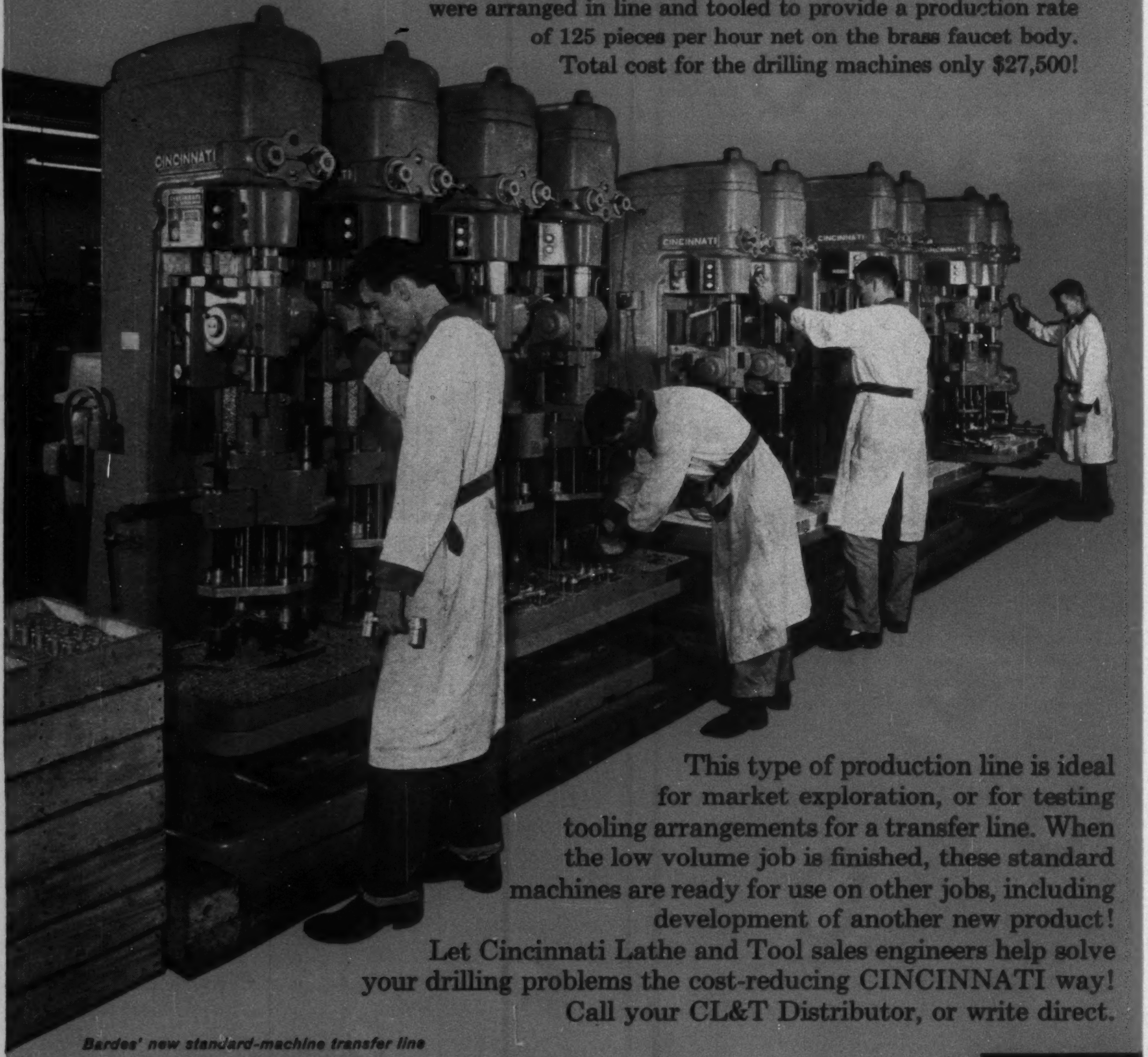
WANTED! *Production line economies for market exploration...*



At Bardes Corporation in Cincinnati, Milt Garvin, Vice President, talked over this problem with his Cincinnati Lathe and Tool distributor. "We continually develop new plumbing products—like this faucet body which has 30 operations including drilling, hollow milling, boring, tapping and threading. We'll use a transfer machine when we hit high volume. Right now we need a machining line for low-cost, diversified small-lot production."

DELIVERED! *A low-cost machining line from standard machine tools...*

Four CINCINNATI 21" Sliding Head Drills—one 4-spindle and three 2-spindle models—were arranged in line and tooled to provide a production rate of 125 pieces per hour net on the brass faucet body. Total cost for the drilling machines only $27,500!



This type of production line is ideal for market exploration, or for testing tooling arrangements for a transfer line. When the low volume job is finished, these standard machines are ready for use on other jobs, including development of another new product! Let Cincinnati Lathe and Tool sales engineers help solve your drilling problems the cost-reducing CINCINNATI way! Call your CL&T Distributor, or write direct.

Bardes' new standard-machine transfer line for low-volume plumbing equipment.

CINCINNATI LATHE AND TOOL CO.
Cincinnati 9, Ohio
HYDRASHIFT Lathes • CINCINNATI Drilling Machines • SPIROPOINT Drill Sharpeners

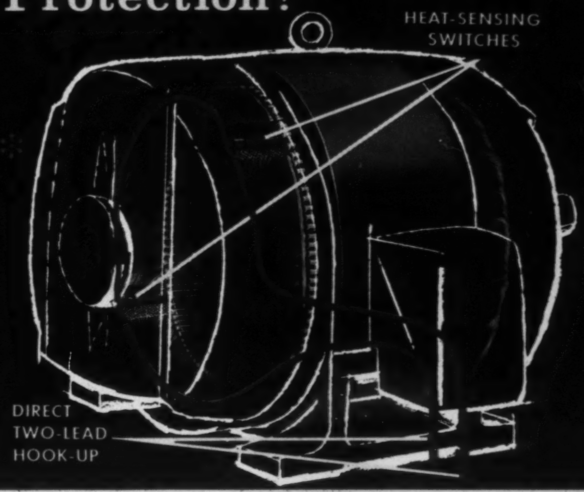
GENERAL ELECTRIC

New Concept in Motor Protection!

Tri-Clad '55' Thermo-Tector*

SYSTEM ENDS OVERLOAD BURNOUT!

*Trade mark of General Electric Co.



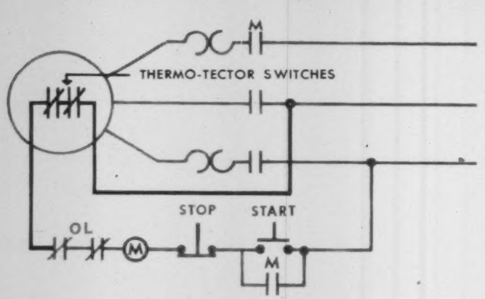
General Electric offers a *totally new* type of protection on *all* Tri-Clad '55' motors 7½-125 hp!

Exclusive THERMO-TECTOR system has heat-sensing switches buried in stator windings. Switches shut off motor *only* when stalls, overloads or other conditions threaten heat damage to motor windings.

Unique THERMO-TECTOR system "anticipation" feature varies motor shut-off point according to rate of winding heat rise. This flexibility allows *maximum motor output* under all conditions.

TURN PAGE FOR FURTHER INFORMATION ➡ ➡ ➡

NEW Tri-Clad '55'
THERMO-TECTOR SYSTEM
Allows Full Motor Output—
No Wasteful "Safety Margin" Needed



Thermo-Tector system needs *no costly amplifying relays,* connects directly to any G-E motor controller.

You get full output from Tri-Clad '55' motors with Thermo-Tector system. Variable response feature of heat-sensing switches allows motor to operate right up to safe limits under any operating condition.

Thermo-Tector switches are offered on *all* Tri-Clad '55' motors in frames 254U-445U. For more information, contact your G-E Apparatus Sales Office or write for Bulletin GEA-7092, Section 866-03, Schenectady 5, N. Y.

SMALL AC MOTOR & GENERATOR DEPARTMENT

GENERAL ELECTRIC

J. H. Zillman, elected vice president, Data Processing Divisions, Consolidated Electrodynamics Corp.

National Can Corp.—**S. M. Hopkins,** elected president and a director; **Robert Stuart, H. N. Eidswick,** and **Frank O'Brien, Jr.,** elected vice presidents.

The Rotor Tool Co.—**Richard Allchin,** named president; **H. P. Bailey,** bacomes board chairman; **L. W. Dwors,** becomes vice president, manufacturing; **H. L. Whitehouse,** becomes director, engineering and secretary-treasurer; **James Murphy,** becomes a company officer; **Paul Van Sittert,** named director, research.

Rockbestos Wire & Cable Co., Div. of Cerro de Pasco Corp.—**A. S. Basil,** named president.

Lawrence Litchfield, Jr., named president, Aluminum Co. of America, Pittsburgh.

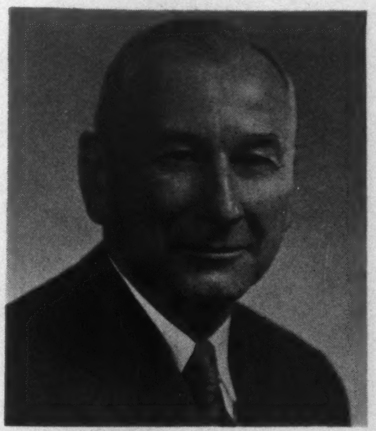
Thompson Ramo Wooldridge Inc.—**J. H. Kerr,** becomes vice president and general counsel; **E. E. Ford,** becomes asst. general counsel and **P. W. Schuette,** named secretary. Elected to vice presidencies of the corporation were **G. W. Fenimore,** general manager, TRW International Div., **W. B. Hayes,** general manager, TRW Electronic Components Group, both of Los Angeles; and **J. H. Shaffer,** who directs sales, Tapco Group, Cleveland.

General Motors Corp.—**R. C. Gerstenberg,** elected vice president, financial staff.

Hooker Chemical Corp.—**F. L. Bryant,** elected executive vice president and a director.

Grove Valve & Regulator Co.—**G. E. Doty,** promoted to vice president and general sales manager, Oakland, Calif.; **B. J. Hancock,** named vice president, sales, Houston, Texas; **E. C. Bird,** appointed Houston district sales manager.

U. S. Steel Corp., Consolidated Western Steel Div.—**M. P. Klick,** appointed engineering consultant; **Milton Karr,** named chief engineer.



F. L. Magee, elected chairman of the board, Aluminum Co. of America, Pittsburgh.

D. C. Barnum, named manager, industrial relations, Bethlehem Steel Co., Bethlehem, Pa.

Quaker State Metals Co.—**H. Y. Smuck,** appointed chief executive officer and general manager, and **T. M. Zimmerman,** executive vice president.

P. R. Mallory & Co., Inc.—**Dr. D. G. Wilson,** named vice president, research.

Chicago Bridge & Iron Co.—**G. S. Trees,** elected a vice president.

Hendrick Mfg. Co.—**K. H. Col-**

D. A. Potter, elected vice president, Stewart-Warner Corp., Chicago.

STRAITS TIN REPORT

News of developments in the production and uses of tin

MALAYAN TIN BUREAU

Nontoxic, inert, malleable — all three are descriptive of tin. One of man's oldest metals, it is still vital in our modern economy. For example —

For product protection, 60.7% of all tin consumed in the U.S. is used in manufacturing tinplate, largely for containers. 135 industries package a total of over 2500 products in more than 42 billion cans annually!

For joining and sealing, 14.8% of all tin used is in alloy with lead to form solder.

For strength and corrosion resistance, 6.5% is consumed in the tin-copper alloy, bronze.

For anti-friction properties, 4.1% is consumed in the high-tin/lead alloy, babbitt, generic for bearing metals.

For protective coatings, tinning accounts for 3.9%. Hot-dipped tin provides a smooth, reflecting surface, particularly adaptable for food processing equipment.

For castability, white metal — alloys of tin, antimony, lead, bismuth, and copper — account for 3.2% of U.S. tin consumption.

Miscellaneous alloys use 4.2%; chemicals, 1.1%; and collapsible tubes, 1.5%.

There's no substitute for tin . . . and no substitute for Straits Tin from Malaya — recognized standard for quality and uniformity, available in reliable supply from sizeable reserves.

Write today for more data on these items or for a free subscription to TIN NEWS—a monthly bulletin on tin supply, prices and new uses.

The Malayan Tin Bureau
Dept. 54-J, 2000 K Street, N.W., Washington 6, D.C.

ville, Jr., appointed director, sales and marketing.

The Goodyear Tire & Rubber Co., Industrial Products Div.—**W. A. Cooper,** named manager, distributor sales.

J. J. Hope, appointed general manager, Vulcan Tool Co., Buffalo, N. Y.

C. I. Hayes, Inc.—**S. B. Ashton,** appointed chief engineer.

Weirton Steel Co., Tin Mill Products Div.—**J. F. Perko,** named supervisor, customer service.

The Youngstown Sheet & Tube Co.—**M. H. Mason,** appointed asst. supervisor, training.

Pittsburgh Steel Co. — **R. E. Hynes,** named manager, employee communications.

D. B. Ellison, appointed sales manager, Eastern Stainless Steel Corp.

G. M. Wood, named general manager, Peterson Steels (Canada) Ltd.

Sharon Steel Corp.—**J. E. Brady,** elected comptroller and asst. treasurer.

Air Reduction Sales Co.—**C. J. Langley,** appointed asst. district manager, Philadelphia.

Reed Instrument Bearing Co., Div. of SKF Industries, Inc.—**C. C. Weigold,** named plant manager, Los Angeles.

T. W. Matchett, appointed general manager, Pershing Road plant, Chicago, Link-Belt Co.

Hartman Metal Fabricators, Inc. —**C. W. Hunter,** named sales manager; **C. J. Selden,** named asst. general manager.

Avery & Saul Co., Inc., Special

(Continued on P. 108)

Mr. S. E. Miller,
Vice President and
Division Manager
of American Bosch Arma,
shows the hundreds
of items which go into
the manufacture
of a fuel injection pump
(upper left of table).

IBM MOS

MANAGEMENT OPERATING SYSTEM SAVES AMERICAN BOSCH $120,000 YEARLY ON SHOP ORDERS ALONE

...TRIPLED SAVINGS ANTICIPATED WHEN SYSTEM IS EXPANDED!

American Bosch has turned to IBM's new systems techniques for faster, more sensitive control of its manufacturing cycle at the Springfield, Massachusetts, plant. Utilizing the IBM Ramac 305, the Management Operating System has been applied to Materials Planning and Inventory Management, and large savings have already accrued.

These additional savings are expected from methods now in use:

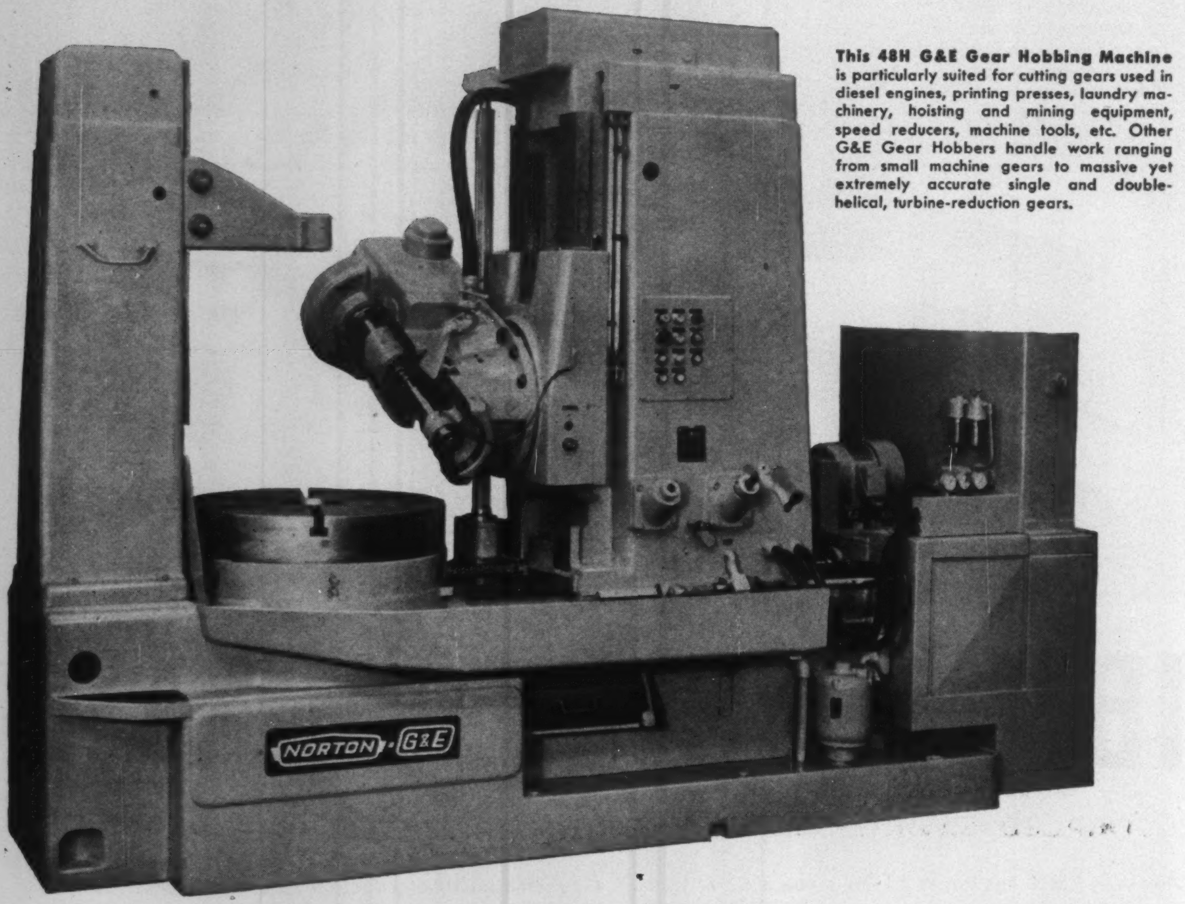
■ sharp reduction of machine setup costs. ■ standardized production levels, to minimize manpower fluctuations and concentrate inventory dollars on active sales items. ■ substantial time reduction in production schedule changes. ■ automation of annual standard cost revisions, with a 70% expense cut.

When the Management Operation System is extended to other areas, American Bosch estimates that savings will be tripled.

MOS can be applied to most industrial operations, with specially trained manufacturing representatives to assist you. IBM Balanced Data Processing provides comprehensive support in applying the system to your company's operation. For full information, call your nearest IBM office.

BALANCED DATA PROCESSING ▲ **IBM®**

How G&E gear hobbers combine high precision with high production...



This 48H G&E Gear Hobbing Machine is particularly suited for cutting gears used in diesel engines, printing presses, laundry machinery, hoisting and mining equipment, speed reducers, machine tools, etc. Other G&E Gear Hobbers handle work ranging from small machine gears to massive yet extremely accurate single and double-helical, turbine-reduction gears.

for *your* high profits

NORTON PRODUCTS: Abrasives • Grinding Wheels • Machine Tools • Refractories • Electro-Chemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

Gould & Eberhardt Universal Gear Hobbing Machines meet practically every industrial gear cutting requirement. Built for fast, dependable performance, they're established cost-cutters for rapid production of spur gears, single and double-helical gears, sprockets, splines, worm gears, worms, ratchets and special forms — in a wide range of pitches and diameters.

Highest production at lowest hob cost is assured by the highly developed vertical cutting principle, substantial hob support, gear trains and adjustment features.

And here's a fact it will pay you to remember:

The original productivity and accuracy built into hobbers by G & E is maintained at highest levels — and with every possible advancement — by the assimilation of G & E experience and personnel into the progressive and modern machine tool building operations of Norton Company.

For careful help in selecting Gear Hobbers or other G & E equipment that will benefit your production see your G & E dealer or write to Norton Company, Gould & Eberhardt Division, Worcester 6, Massachusetts.

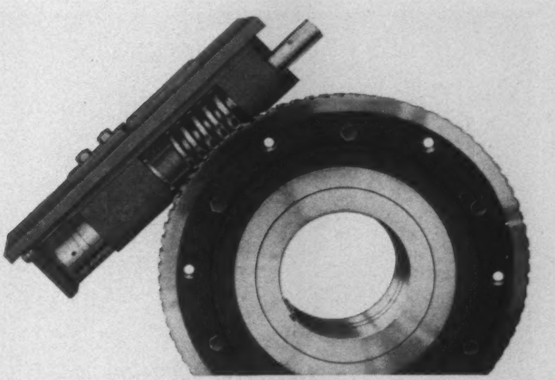
NORTON

MACHINE TOOLS

75 years of . . . **Making better products**
. . . **to make your products better**

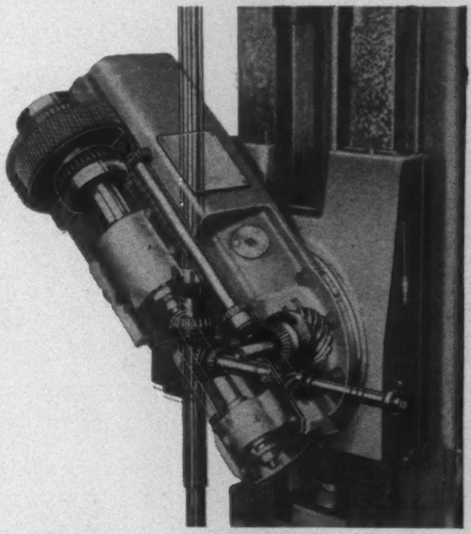
HIGH PRECISION HIGHLIGHTS

Vertical Feed. Optimum accuracy is secured by a large diameter feed screw, precision-cut in a temperature-controlled laboratory and rigidly anchored in tapered, preloaded precision roller bearings. Backlash control is maintained by an easily adjusted two-piece bronze feed screw nut.



Indexing. DUALEAD® worm-gearing assures accurate indexing under heaviest production. The worm thread, with progressive variation throughout its length, simplifies adjustment by providing backlash control without change of center distance and insures uniform transmission of motion in both directions of rotations through proper conjugate tooth action, thus maintaining accuracy of index under high operating speeds and over an extended period.

The maximum wear-resistance quality of the mating chill-cast nickel bronze DUALEAD index worm gear results in minimum wear to maintain extreme accuracy longer.



HIGH PRODUCTION HIGHLIGHTS

Rapid, Precise Hobbing. Speed and accuracy for sustained high production rates — as well as extra-long service life of hobs and machines — are assured in G & E Hobbers because:

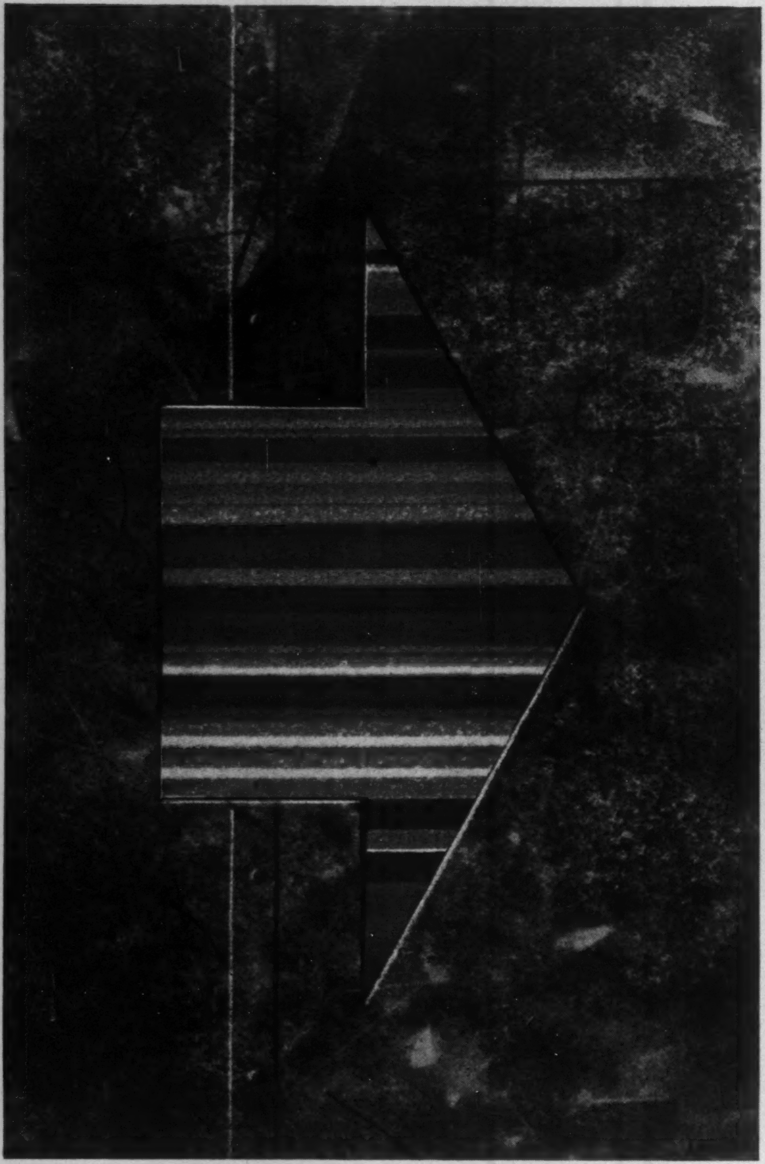
. . . The heavily proportioned, easily adjusted hob slide travels on double rectangular guides for sustained accuracy in basic motion.

. . . The single-helical final-drive gear to the hob is independently mounted on large antifriction bearings to prevent compounding stresses on the hob spindle.

. . . The fixed-position work table is located in a large tapered bearing and supported by a flat annular bearing to absorb cutting stresses.

. . . The hob arbors are heat treated and chrome plated to reduce wear and eliminate the tendency to raise burrs which cause eccentricity and hob wobble.

MACHINE TOOL DIVISION: Grinding and Lapping Machines — **G & E DIVISION:** Shapers • Gear Cutting Machines • Gear Induction Hardeners



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Our new space-saving centrifugal fan and catalog will be available in October. Why not write now and reserve a copy of the catalog? You can be sure if it's Westinghouse. Sturtevant Division, Hyde Park 36, Massachusetts.

Westinghouse

(Continued from P. 104)

Products Div.—**P. E. Warburgh,** named manager, sales.

George Ramsden, named general manager, Caldwell plant, Chicago, Link-Belt Co.

G. A. Stone, named general manager, North Central Div., Minneapolis, Link-Belt Co.

Allis-Chalmers Mfg. Co.—**W. F. Strehlow,** named senior consulting engineer, Tractor Group; **R. S. Reaves,** appointed chief engineer, Farm Equipment Div.'s tractor works at West Allis (Wis.).

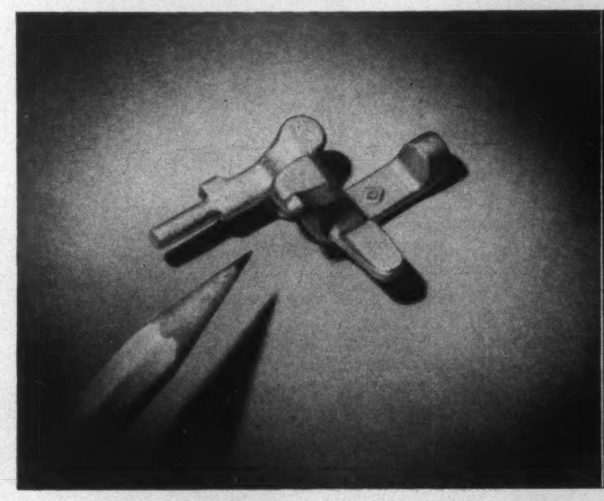
OBITUARIES

C. M. McCreery, 74, former vice president, Revere Copper & Brass Inc.

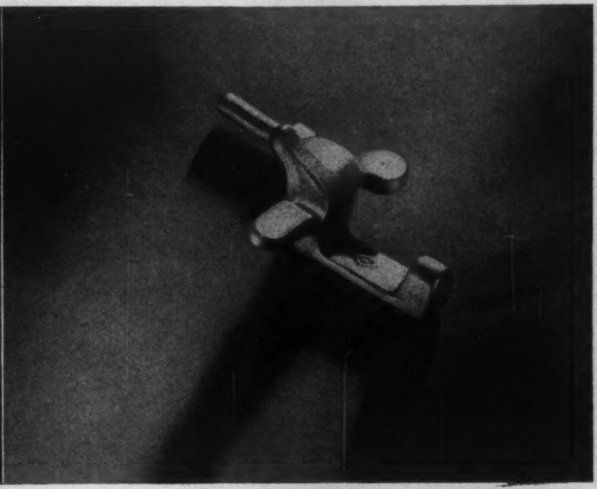
D. F. Fraser, 47, vice president, manufacturing, Garlock Inc.

M. M. Biddison, 68, former president, General Chemical Div., Allied Chemical Corp.

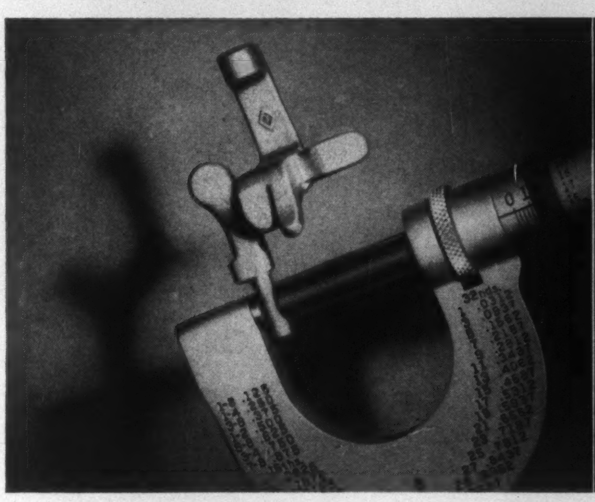
THIS INTRICATE FORGED PART WILL GIVE YOU NEW IDEAS . . .



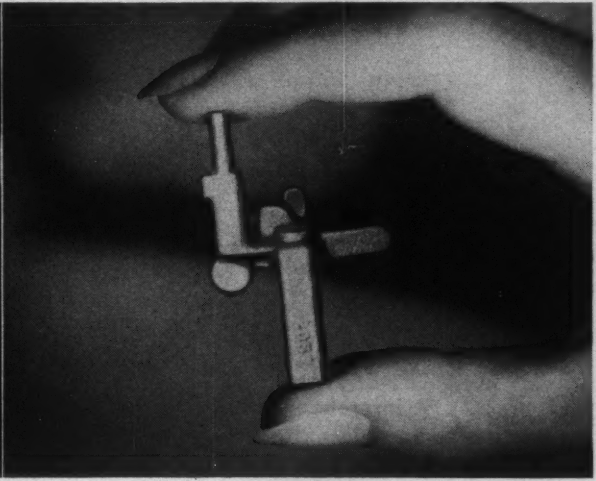
ON STRENGTH Insurance against equipment failure was the primary specification for this steel part for an electronic key punch machine. A Williams forging was selected to give the required strength and toughness for greatest dependability during high speed operations.



ON SHAPE The complicated contours of this part require controlled grain flow in many directions to provide maximum strength at points of greatest stress. Here the desired result was achieved by a parting line that is a complex intersection of 5 planes and 2 curved surfaces.



ON SIZE No part is too small for Williams. This part weighs only ½ ounce, yet Williams forging designers give the same attention to quality and cost of manufacture within close tolerances as they do to large forgings weighing up to 250 lbs.



ON FORGEABILITY Besides greater freedom of design, Williams forgings often result in fewer finishing operations, lower unit cost at point of assembly and dependability for years of heavy duty, in-service use. Let us help you determine the *forgeability* of your next part.

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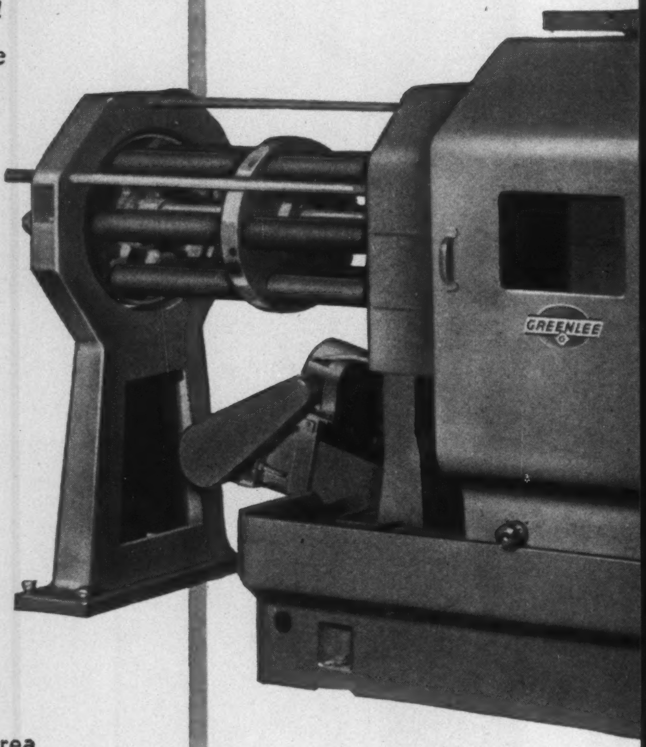

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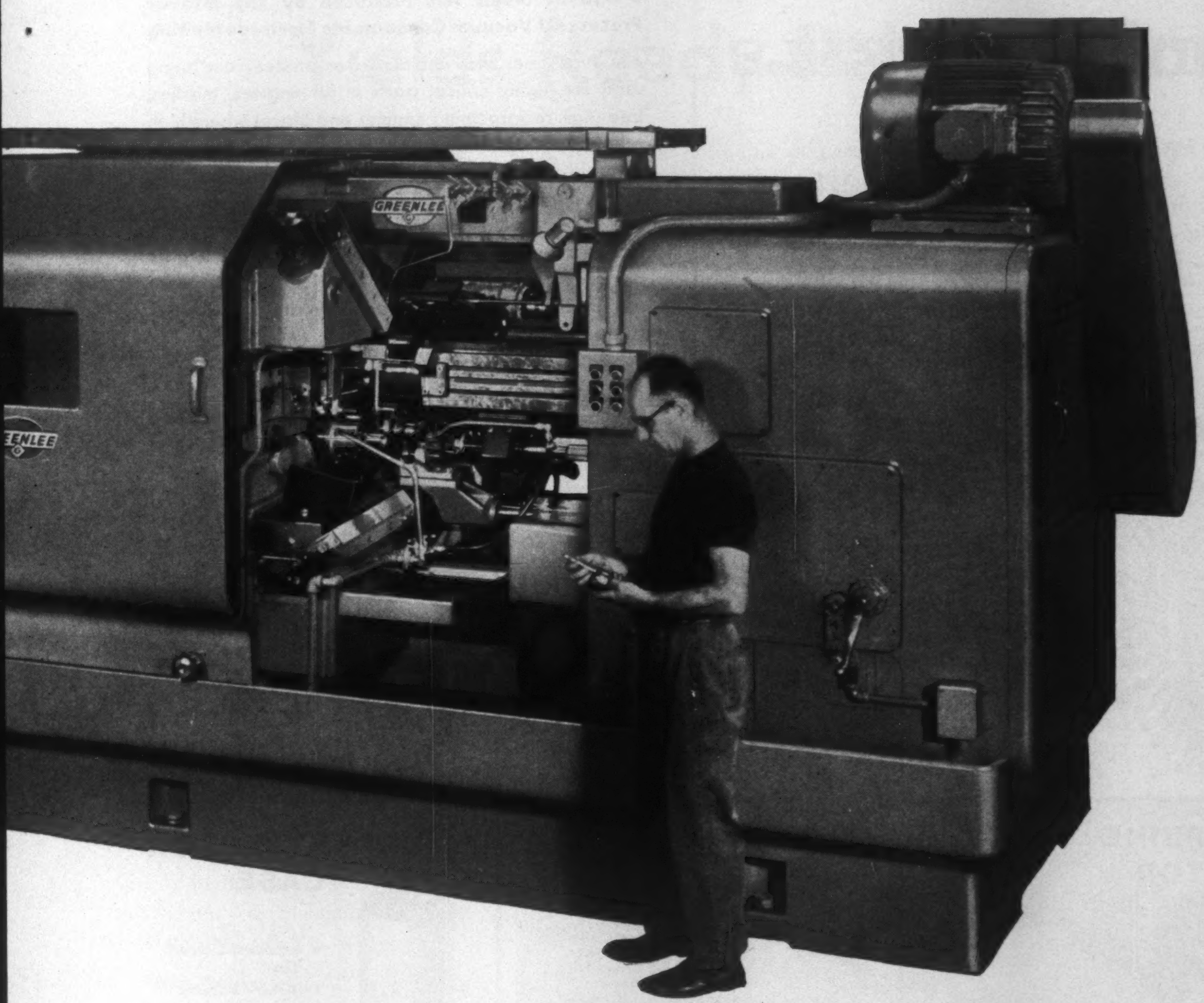
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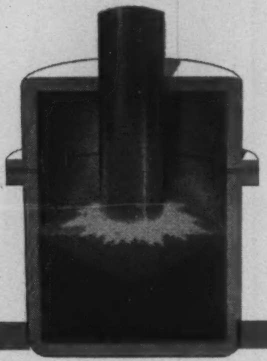

Simplified illustration of Midvac Process of consumable electrode vacuum melting.

Fine electric furnace steel electrodes are melted in water cooled copper ingot mold under vacuum of 5 to 50 microns

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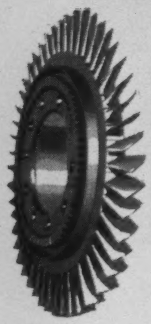

TURBINE WHEEL

- Stress rupture hours increased from 15 to 100 hours.
- Improvement in macro etch quality

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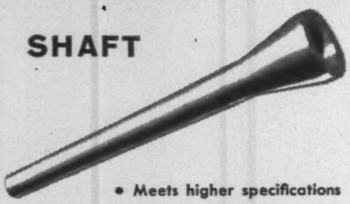
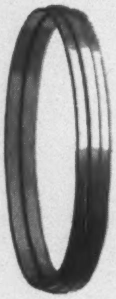


- Meets higher specifications
- 33% Increase In Elongation
- 38% Increase In Reduction of Area
- Improved Forgeability and Fatigue Strength



BEARINGS

- Rejects Reduced 73%
- High Level of Cleanliness
- Increased Fatigue Strength

TURBINE ROTOR

- Improved Tensile Ductility, Lower Transition Temperature, Higher Impact Strength
- Higher Magnetic Permeability
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ROLLS

- Polished in ½ to ⅔ Time Previously Required
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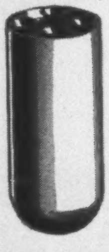
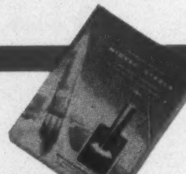
ROCKET MOTOR CASE



- Maximum Cleanliness
- Higher Ductility
- Improved Shear Forming

New technical data book on Midvac Process and properties of super alloy steels, melted by consumable electrode vacuum melting, now available upon request.



MH *Midvac Steels*

Aluminum Strip-Finishing Line Yields Ready-Painted Coils

A new processing line paints both sides of aluminum strip. In one pass, it can apply different colors to each surface.

Without damaging the finish, painted stock can be sheared, slit, formed and pierced.

▪ A new coating line for aluminum strip offers fabricators a source of ready-painted stock. The new line handles aluminum in strip widths up to 66 in. It can coat either or both sides at speeds up to 100 fpm. The reverse side of a strip can even be painted a different color.

The coating line eliminates a costly finishing problem—that of tying up valuable floor space with special finishing equipment. Painted stock from the new line can be sheared, slit, formed and even pierced without damaging the finished surfaces.

This extremely wide-strip coating line is in operation at The Kaiser Aluminum & Chemical Corp., Ravenswood, W. Va.

Strip Preparation—The heart of the processing takes place as the metal is cleaned, rinsed, prepared for painting, coating and drying. In the cleaning stage, the aluminum passes through a rectangular tunnel inside a 90-ft metal-preparation machine. Designed by J. O. Ross Engineering, a div. of the Midland-Ross Corp., New York, the big unit cleans as well as prepares the strip.

Most of the equipment, and much of the engineering, were supplied by two divisions of Midland-Ross Corp. Roll-coating and strip-handling equipment came from the Waldon-Hartig Div., New Brunswick, N. J. The units that prepare the metal prior to coating and baking are products of the J. O. Ross Engineering Div.

At the start of the line is a Waldron two-spindle turret uncoiler. One spindle unwinds the coil. The other is a standby unit. Each coil is supported between a pair of arms by means of expanding mandrels.

These arms can be adjusted to handle various strip widths. They also serve to center the strip.

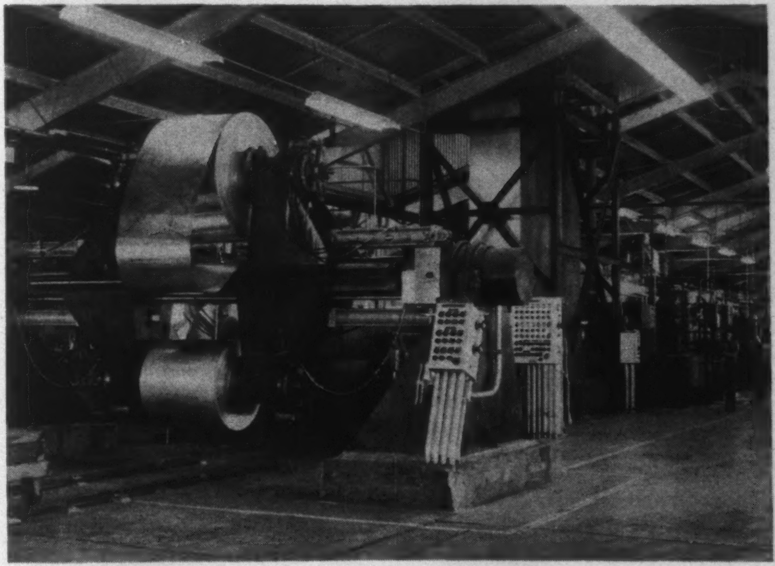
Thread into Line—Each coil unwinds under the shaft of the uncoiler. When the coil has nearly run out, the strip is severed. At this point, strip from the standby coil is threaded into the line. The spent spindle is then fitted with a brand-new coil and is moved to the standby position.

Strip next passes through a Waldron feed-roll stand. Normally, the upper roll of this stand acts as a guide roll. It directs the unwinding strip into the line.

This operation differs slightly during splicing. Just as soon as the trailing edge of the old strip has passed by, the lower roll is brought up to the upper one. New strip passes between the rolls, and the feed-roll stand advances the new strip into the line.

It jogs the leading edge of the strip forward into the shearing position. Here, the end is squared. After shearing, the strip advances to the stitching position.

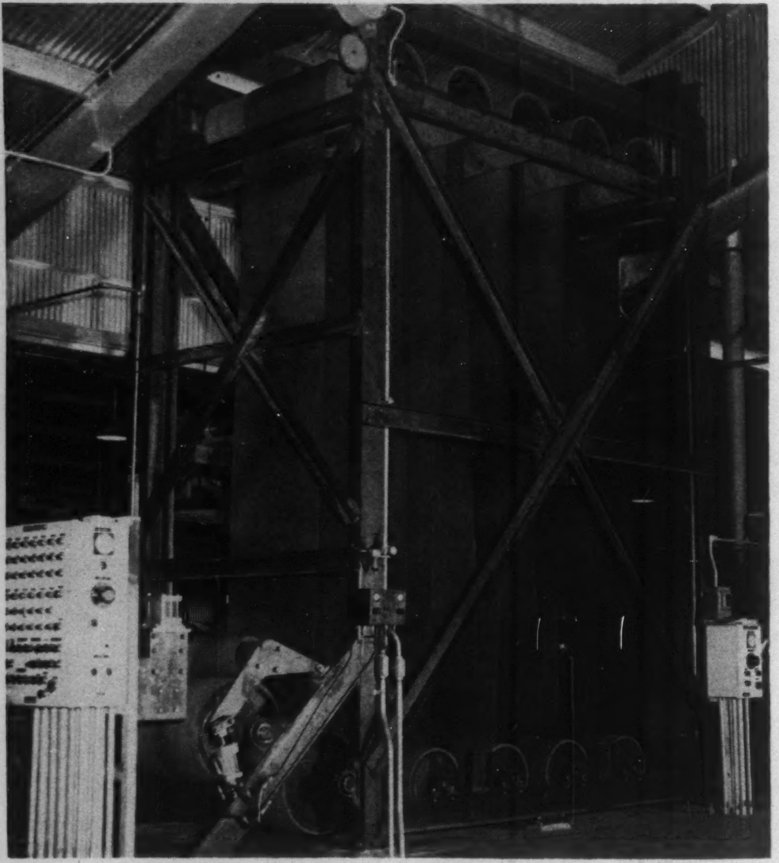
At the stitcher, a transverse bar



TURRET UNCOILER: At the start of the processing line is a two-spindle turret uncoiler. One spindle unwinds the aluminum coil. The other is a standby unit. When the coil has almost run out, the strip is cut.

Preparation Cycle Moves Fast

STAGE	TIME
1 Clean	20-30 seconds, at 160°F
2 Rinse	5-10 seconds, at 130°F
3 Chromate	15-20 seconds, at 110°F
4 Rinse	5-10 seconds
5 Acid	5-10 seconds, at 140°F



ENTRY STORAGE: During normal operations, an entry accumulator stores strip. It plays this strip out to the line when a new coil is spliced in. When the stored supply is depleted, the upper rolls move downward.

holds the trailing edge of the previous strip under the stitching head. A second bar clamps the leading end of the new coil, as it's jogged into place. The switching arm transverses these over-lapped strips and stitches them together.

Flatten Burrs — Behind the stitcher is a set of edge-flattening rolls. These rolls flatten burrs and other edge irregularities.

Next in line is the entry accumulator. It stores a backlog of strip. This allows the line to operate while a splice is being made.

After a splice has been made, the entry bridle automatically feeds at a greater-than-normal speed. Thus, it restocks the accumulator and allows the floating rolls to reach their normal (elevated) positions. At this point, the bridle reverts to normal speed.

From the accumulator, the strip passes through a lead-in roll stand. This stand establishes a pass-line height for entering the combination cleaning and preparation unit.

Five Working Stages—There are five stages in the cleaning and preparation cycle. A quick rundown on this cycle appears in table form. The third stage is the most important. It applies chemical coatings for improved paint adhesion.

A pair of squeeze rolls is located between each stage. They prevent solution transfer from one stage to another. These rolls are rubber coated and they're mounted on pivots to avoid tracking problems. Roll pressure — applied to the traveling strip—is adjustable.

All solutions that are sprayed on the strip are heated by indirect-fired gas burners. For maintenance, each burner is easily removed.

Indicating-type temperature controllers regulate each burner. Each controller serves a single burner and has a sensitive, temperature bulb within the tank.

Each pump discharge has a thermometer. This permits observation of the solution's heat within the circulating systems.

Keep it Straight—At the unit's exit there is a pair of tracking squeeze rolls. These rolls have a sensing device which causes a mechanism to shift the strip whenever it becomes misaligned.

After leaving the cleaning and preparation unit, both sides of the strip are dried. High-velocity air speeds the drying cycle. Then the strip moves along a Z-shaped path. This allows the strip to cool, before it enters the coating room.

Strip enters the coater from beneath the floor. It travels upward, making an S-shaped turn around two large rolls; then it continues to the oven. As it rounds the top coil, paint is applied by a small-diameter applicator.

This applicator rotates in reverse to the direction of strip travel. It wipes an accurate coating thickness onto the moving strip.

Controls Paint Thickness—The opposite side of the strip passes over a second applicator as it leaves the coater. Thus, both sides may be painted with one pass through the line.

Fixed amounts of paint are picked up from coating pans and are transferred to the applicators by chrome-plated steel rolls. Each roll in the coating heads is individually driven. This permits variable-speed operation. It also insures a wide range of precise coating weights.

When a spliced section of strip passes through the coater, the applicator and pick-up rolls drop out of position.

After coating, the strip travels about 8 ft inside the coating room, prior to entering the bake oven. This lets the solvent "flash off," before drying.

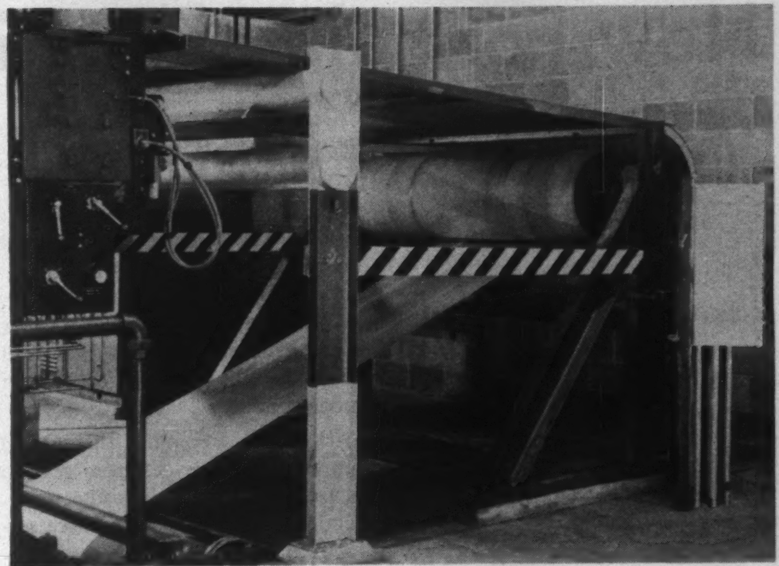
Three-Zone Oven—Independent heaters and regulators control each zone of the 100-ft long oven. Painted strip bakes at average oven-air heats of 250°F in the first zone. In the second zone the heat is about 450°F. It climbs to 650°F in the third zone.

Circulating fans supply heated air to each zone. Air velocities are adjustable.

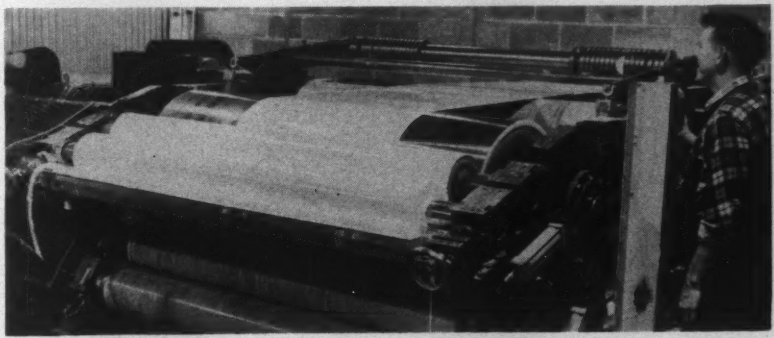
After the strip is coated, it can't pass over rollers until it dries. Therefore, in its travel through the oven, the strip remains unsupported. It forms a catenary more than 100 ft long.

When baking is completed, the strip passes through a water rinse. Then it's dried by squeeze rolls. These rolls are like those used in the cleaning and preparation machine.

Next, the strip moves through an exit-drive bridle. This bridle is synchronized with the entry-drive bridle. This lets the two bridles act as a single unit in moving the strip through the line.



FAST EXIT: Leaving the cleaning and preparation unit, the strip moves along a Z-shaped path. This helps to speed cooling, prior to coating.



PAINTED SURFACE: One surface is painted as the strip passes under an applicator roll. On the opposite side of the machine, a second applicator coats the underside of the strip—with one pass through the line.

Temporary Storage—Behind the exit bridle is a second accumulator. This accumulator normally runs empty. It has both fixed and floating rolls. The upper rolls float close to the lower (fixed) rolls.

As a completed coil is removed, the floating rolls rise toward the top of the accumulator. This allows the rolls to store metal—until the splice is cut out.

An exit-roll stand is located at the discharge end of the line. Whenever a coil is removed from the line, a small roll on this unit clamps the strip against a large roll. Then it jogs the strip forward. This positions the strip under the shear tool, where splices are removed.

A pair of rolls directs the strip into a rewind stand. After it's coiled, the completed strip is removed by transfer car.

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Ask for Reprint **No. 106.**

New Formula Simplifies Worm-Gear Ratings

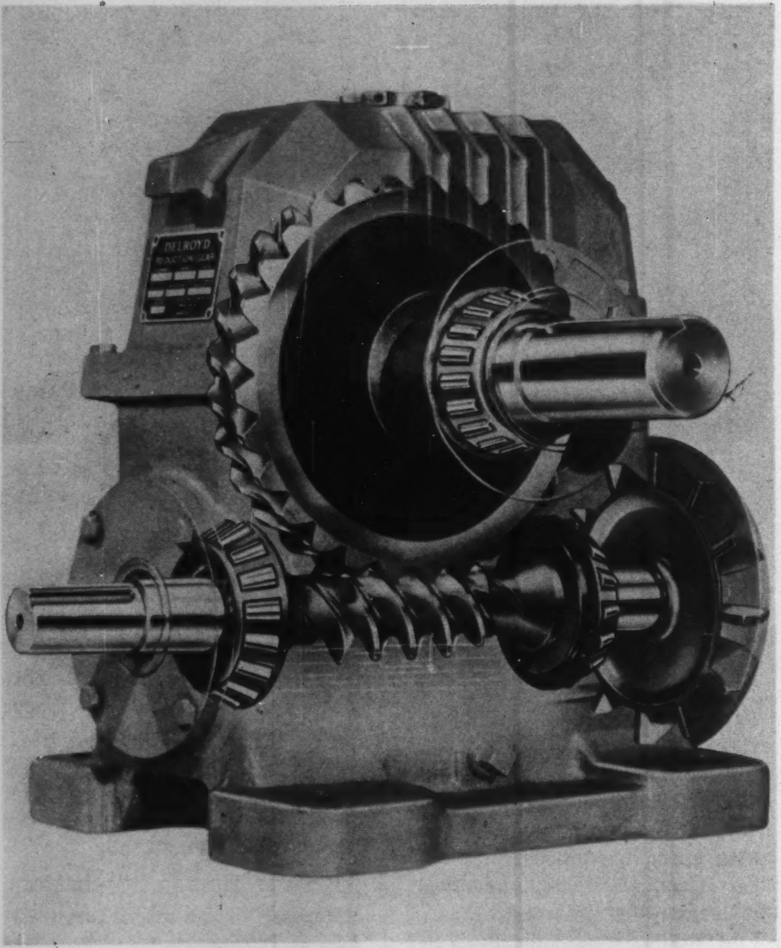
By **J. E. Gutzwiller**—Asst. Chief Engineer, DeLaval Steam Turbine Co., Trenton, N. J.

The AGMA recently adopted a new worm-gear rating standard. It contains data for rating all kinds of worm gearing.

It also provides specifications for the design of worm-driven speed reducers.

▪ Worm gears and worm-gear speed reducers are vital industrial tools. They play a major role in modern industry.

However, too often these tools are abused. Over-design in gearing causes needless and costly waste. Under-design causes even more serious headaches. It's often the culprit behind unpredictable breakdowns.



SINGLE-WORM REDUCER: This compact, right-angle, speed reducer handles many power-transmission needs. It uses a single worm for reduction. Space can be saved by placing the motor and reducer alongside, over or under the driven machine. Standard ratios range from 5:1 to 70:1.

All of this waste can be eliminated, if the engineer or designer rates his gearing requirements to properly fit the job. Of course, the rating of gears and geared reducers requires a sound set of standards.

One for Two — The American Gear Manufacturers' Association recently adopted a new worm-gear rating standard. It replaces two separate standards—AGMA 213.02 and AGMA 440.02.

Designated as AGMA 440.03, the newcomer contains data for rating all kinds of worm gearing. It also provides specifications for the design of speed reducers in which worm gears produce the main form of reduction.

A formula for rating worm gearing appears in the new standard. This formula is a complete departure from the previously used ratios. However, despite this drastic change, most of the underlying theory remains the same.

Useful Ratios—The new formula appears in a box, with this text. This formula consists of two separate ratios or terms. The first term is used to calculate output horsepower. Power loss at tooth mesh can be computed by using the second ratio.

Naturally, the sum of these two terms yields a total input-horsepower rating. This rating is commonly called the "gearing rating."

Power loss at tooth mesh can be computed quickly. However, in actual practice other hidden losses must also be considered. These additional power losses are caused by friction in bearings and oil seals. Churning of the lubricant creates still more losses in power.

For a completely accurate input-horsepower rating of any speed reducer, all power losses must be considered. The hidden losses have to be added to the power loss at tooth mesh. An approximate value for the sum of the hidden losses is obtained by measuring the no-load losses in the speed reducer.

Check Efficiency — Three terms are involved in determining a reducer's input-horsepower rating. These terms provide data for checking overall efficiency at a rated condition.

Efficiency is found by dividing the first term in the new formula (output horsepower or useful work) by the input-horsepower rating.

Recognition of a greater latitude of design and additional combinations of materials are prime features of the new standard. As may be seen from the formula's symbol code, the materials factor (K_S) directly modifies the output-horsepower rating.

In the new standard, values of K_S are given for three different types of gear bronzes. These include centrifugally-cast, static chill-cast and sand-cast bronzes. All operate with worms that have a minimum surface hardness of 58 Rc with a ground finish.

More Versatility—Previous standards made no provision for rating a specific gearing design. Two different designs, having the same basic ratio and center distance, were rated identically—as long as proportions were within fixed wide-tolerance ranges. On the other hand, the new formula's ratings vary with the proportions chosen by the designer.

The new formula also gives greater freedom in dealing with the problem of thermal limitation. AGMA 440.03 sets up a permissible temperature rise at 100°F above ambient.

Thermal-horsepower rating is the amount of power which can be transmitted without exceeding this temperature limit. This rating is determined by tests. Specifications to govern the proper test procedure are included in the standard.

Establishing thermal horsepower by this method, rather than by an empirical formula as used in the past, gives an incentive to the speed-reducer designer. He can pay more attention to reducer losses through gearing and component designs and to increased heat dissipation. This pays off in increased thermal-horsepower capacity.

Determine Power Loss — Test methods for checking total power loss also appear in the new standard. These losses must be known in regard to the power input to the reducer. This is done while operating at rated speed and temperature —and with no useful work being produced at the output shaft.

AGMA 440.03 also outlines methods for rating double-reduction units where worm gears serve as the final gearing. These units may contain either helical gears or worm gears as the primary reduction.

Of special interest to the user is the level of the new ratings. Revisions aren't uniform with gearing size and ratio. Higher ratings have been assigned to centrifugally-cast bronze.

Changes in service factors, made effective by the new standard, modify the ratings for many uses. Factors for worm-gear speed reducers now conform more closely to those for other types of gearing.

Reasons for Change—What are the factors behind the change in rating practice for worm-gear speed reducers? Improvements in materials, manufacturing methods and design are the most important.

To make full use of the new ratings, a number of companies are bringing out new speed-reducer designs. The trend is toward more efficient use of materials.

Most new designs incorporate fan cooling. This increases heat dissipation. It also maintains compact gear casings.

Useful Ratios Aid Designers

$$P = \frac{W_t D\ n}{126{,}000\ m_G} + \frac{v\ W_f}{33{,}000}$$

Symbols:

d = mean worm gear diam, in.
D = pitch diam of gear, in.
F_e = effective face width of gear, in.
K_m = ratio correction factor
K_s = materials factor
K_v = velocity factor
m_G = gear ratio; $m_G = \frac{N_G}{N_W}$
n = worm speed, rpm
N_G = number of teeth in gear
N_W = number of threads in worm
P = input power to gearing mesh, hp
W_f = frictional force, lb
W_t = tangential load on worm gear teeth, lb
v = sliding velocity at mean worm gear diam, fpm
λ = lead angle of threads at mean worm gear diam, degrees
μ = coefficient of friction
ϕ_n = normal pressure angle of worm, degrees

Where:

$$W_t = K_s\, D^{0.8}\, F_e K_m K_v$$

$$W_f = \frac{\mu\, W_t}{\cos\lambda \cos\phi_n}$$

$$v = \frac{\pi\, n\, d}{12 \cos\lambda}$$

F_e = actual gear face width, not exceeding $\frac{2d}{3}$

NOTE: K_m, K_s, K_v and μ can be obtained from tables in AGMA 440.03. K_s has a maximum value of 800, where center distance is less than 3 in.

Finning of the cases is commonly used with these forced-convection designs. The fan is mounted on a shaft that extends from the worm. Air is directed over the speed reducer by a shroud.

Ceramic Coating Fills the Gap For Corrosion-Free Designs

Corrosion and high temperature oxidation hit a wall of resistance in a new coating material.

Ceramic-metal surfaces may be the optimum answer in designing against the elements.

■ A new construction material combines structural strength and resistance to impact damage with resistance to attack in hot, corrosive environments.

Called Nucerite, this family of ceramic-metal composites is expected to be of value in chemical, nuclear and space technology.

Reaches Objective — Commenting on the new development, E. A. Sanford, vice president of The Pfaudler Co., Rochester, N. Y., states: "In developing Nucerite, we have fulfilled a long-term research objective of singular importance to the process industries. With the recent explosive expansion of these industries, areas of application have been created where available materials of construction have not been suitable."

The ceramic material will prove valuable in increasing the rate of chemical reactions which are now held back for lack of a material that withstands corrosive attack at high temperatures. The rate of chemical reaction doubles with every 18°F rise in process temperature.

Higher Degree Expected—Pfaudler engineers report that in one of its formulations the new material has resisted attack by corrosive vapors at 1300°F. This temperature would destroy most metals in a few minutes under the same conditions.

It is expected that even this tem-

WITHSTANDS THERMAL SHOCK—A test sample, coated with the new ceramic-metal material, is heated to 1250°F and quenched with ice water. The material is not affected by drastic temperature changes.

perature will be exceeded by several hundred degrees. In aqueous environments, the newcomer's resistance to corrosion is superior to most metals.

In the laboratory, the product-contact surface of Nucerite illustrates many promising physical properties.

Useful Properties — Tensile strength is very good. Nucerite withstands more stress, without permanent deformation, than mild steel. The ceramic-like material resists 9 ft-lb of point-impact force. This is about 18 times the impact force that's needed to shatter safety-plate glass.

Thermal shock values show a 300-400 pct increase in resistance to damage. The material resists abrasion four times better than laboratory glass. Its heat transfer is rated 6 to 10 times better than other ceramic materials tested.

To illustrate the ceramic material's reaction to high temperatures, a coated molybdenum sample checked at 1600°F shows no oxidation effect. This accents its high-temperature stability.

Many Probable Uses—According to Pfaudler, Nucerite is chemically bonded to steel and to heat-resistant metals, such as Inconel and Hastelloy, in the same manner as other existing glasses.

Because of the nature of some anticipated applications, it is probable that certain reactive metals, such as tantalum, columbium and molybdenum — which maintain strength at elevated temperatures—will also serve as base metals.

Patents applied for by Pfaudler climax a three-year period of intensive research in its own laboratories, supplemented by solid-state research at a leading eastern university.

Theory Behind Properties—The characteristics of the ceramic material are the result of closely controlled nucleation and crystallization within certain ceramic formulations.

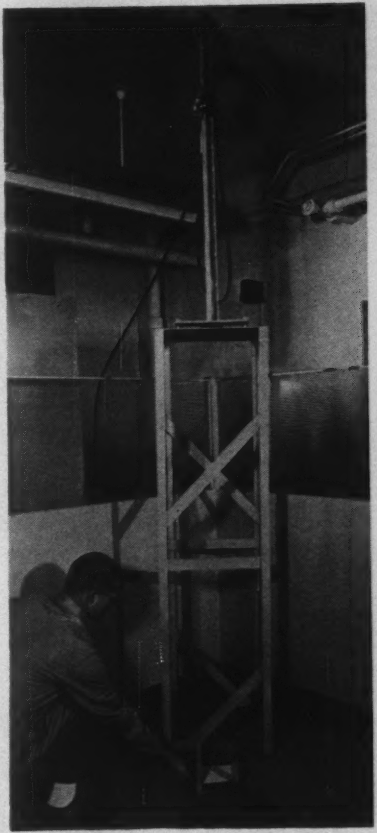
Agents are used which act as centers of nucleation during a heat-treating cycle. This of course follows application of the ceramic components to the base metal.

Carefully controlled nucleation and crystallization result in a ceramic structure that is characterized by a large number of very small crystals. It is this structure that imparts the physical and chemical properties to the material.

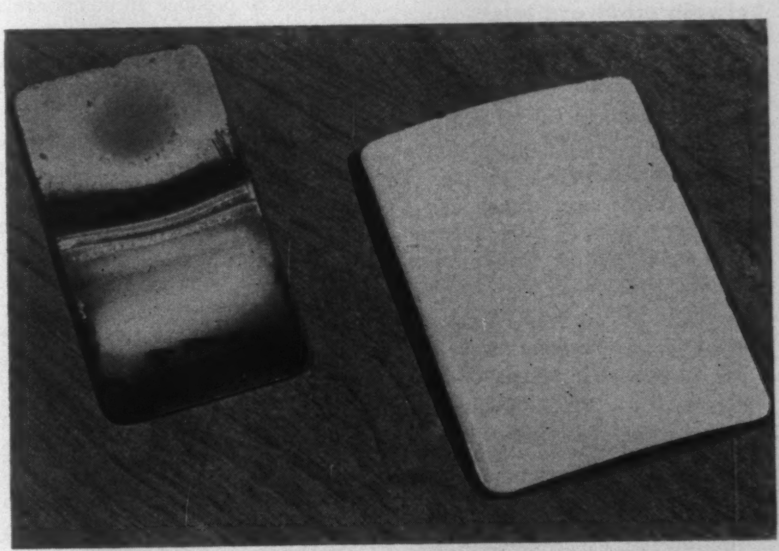
Field Testing — During the development period, the company successfully coated and tested items of process equipment such as reaction vessels and heat-exchanger tubing.

It is emphasized, however, that these results were obtained and confirmed in carefully controlled laboratory and field tests. Additional work will be needed to transform the ceramic coating from the development stage to full-scale production.

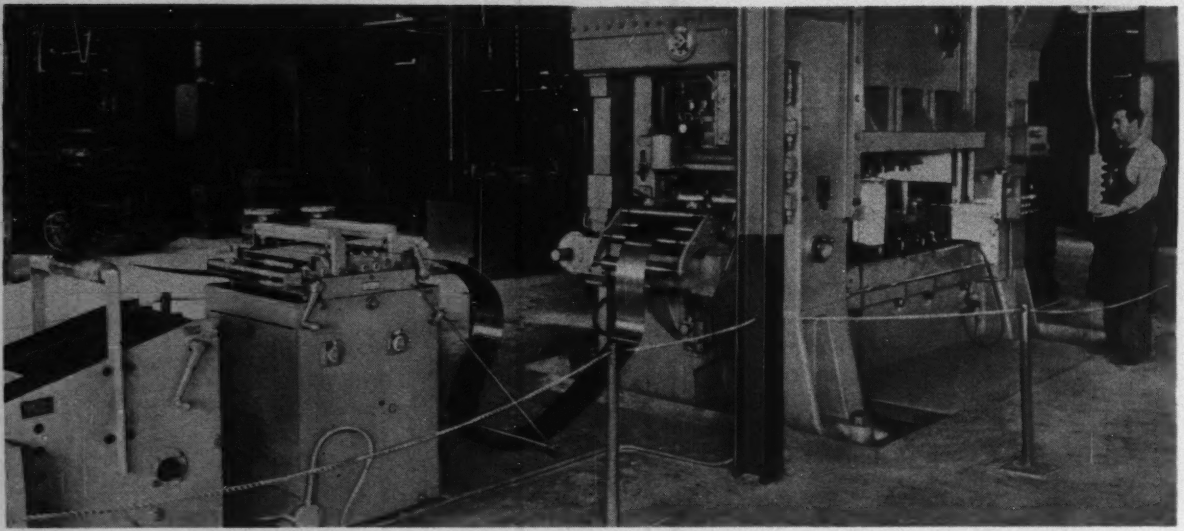
At present, an extended evaluation period of selected field testing in the U. S. is planned. This period will be followed by the establishment of production facilities in all of Pfaudler's domestic and foreign plants.



RESISTS IMPACT—A 2-in. diam steel ball, dropped on the ceramic-metal material from 9 ft, points up its high impact strength. This test proves the material can withstand a point impact force of 10.8 ft-lb.



FLAME TESTED—Refractory metals oxidize at high temperatures. A sample of molybdenum is severely oxidized by an oxyacetylene flame generating 1600°F. The ceramic-metal coating (right) shows no effects.



INTO THE PRESS: Stock moves from the cradle through the straightener; then it feeds into the press.

Progressive Dies in New Press Yield 1800 Parts per Hour

The loudspeaker business is highly competitive. A fraction of a cent makes the difference between profit and loss.

Here's how a well planned program reduced the cost of speaker housings by 50 pct.

▪ A 50-pct reduction in the cost of making loudspeaker conehousings is the result of a well planned punch-press and die-modernization program.

Savings, gained from using the new stamping program, have already enabled The Magnavox Co., Paducah, Ky., to reduce selling prices. This puts the company in an enviable position.

The loudspeaker business is highly competitive. A fraction of a cent makes the difference between getting or losing a big contract.

Many Sizes — At the Paducah plant, Magnavox turns out a wide variety of loudspeakers. Sizes range from 3-15 in. This plant has the facilities to produce all components used in making the speakers.

About 40 pct of the plant's output goes into the company's own radio, television, stereo and hi-fi products. These finished products are made by other divisions of Magnavox.

The remaining 60 pct of the volume is sold, as original equipment, to other manufacturers. These loudspeakers serve in public address systems, car and home radios, televisions sets and even in electric organs.

Most of the production falls in the 6- x 9-, 8- and 12-in. sizes. This work is really job-lot mass production. Here's why. Magnavox has to juggle its work runs to mesh with assembly needs.

Costly Headache — Previously, these conehousing parts were stamped on a series of seven straight-edge presses. These presses used seven, separate, single-stage dies.

Parts were fed manually on single-stroke production. Handling of parts, from press to press, was by chute — via belt conveyors. All sheet steel had to be sheared to desired width for hand feeding the primary-stage press.

Seven presses and seven operators turned out an average of 625 finished parts per hour.

Planned Attack — A carefully planned program, developed by a team of production engineers at the Paducah plant, gives Magnavox a 600-pct savings in direct labor. The program revolves around a 300-ton, two-point, straight-side press.

This huge press, made by the Minster Machine Co., Minster, O., has an automatic feed and five- to seven-stage progressive dies.

Direct cost reductions, gained by

the new stamping process, include: 20- to 30-pct material savings, a 75-pct reduction in die set-up time and about 90-pct less die maintenance.

Process Analysis—The old production method left a lot to be desired. In checking all facets of manufacturing costs, the production-engineering team studied various approaches to the problem.

The head of this Magnavox team, F. J. Henry, chief industrial engineer, states: "It became apparent that extensive modification to existing equipment and/or procurement of new facilities would be needed before any savings could be made."

At first, Mr. Henry's team intended to use the existing dies—in the interest of economy. The original plan was to automate the existing seven presses. These old presses would be treated as a line. Transfer devices could carry the parts through the seven single-stage dies.

However, this setup would call for new electrical controls. In addition, costly transfer units require a lot of expensive installation.

Open Proposals—The engineering team looked into available transfer-press units. They asked for recommendations and proposals from the major press builders.

The Minster Macnine Co. suggested the use of progressive dies in a new 300-ton straight-side press, designed for automatic feeding. At first, the Magnavox team was skeptical of the progressive dies. They doubted whether these dies could handle conehousings in sizes up to 6 x 9 in.

Minster pointed out the low initial investment, long die life and other production economics. Also cited was the advantage of getting such equipment installed, and in production, at an early date.

General Review—The Magnavox team reviewed this recommendation from every angle. They checked product design, tooling, available floor space, the condition of existing dies, work scheduling, equipment maintenance and materials handling.

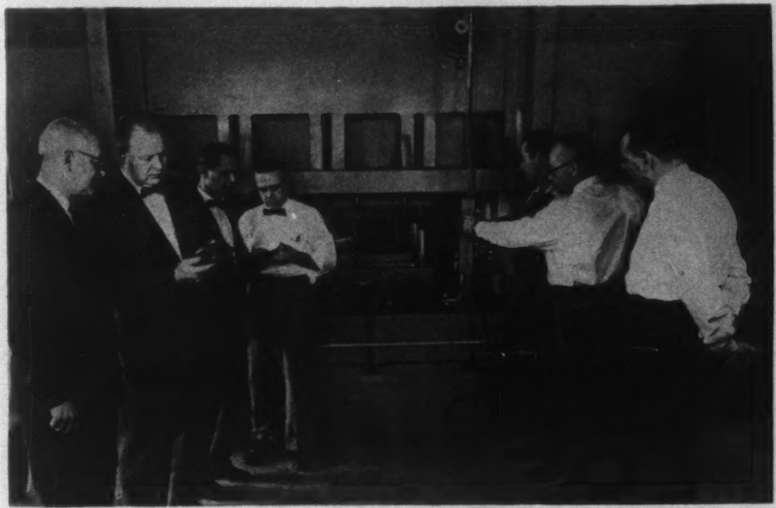
After careful study, they decided to survey all available press equipment suitable for forming cone-housings. This survey led to the selection of a new Minster press.

Minster recently designed the Progress - O - Matic, a two - point, straight-side, automatic-production press. This 300-ton press is double geared. It has opposed, helical twin-drive gears. It also has a combination air friction clutch and brake-drive device on the intermediate shafts.

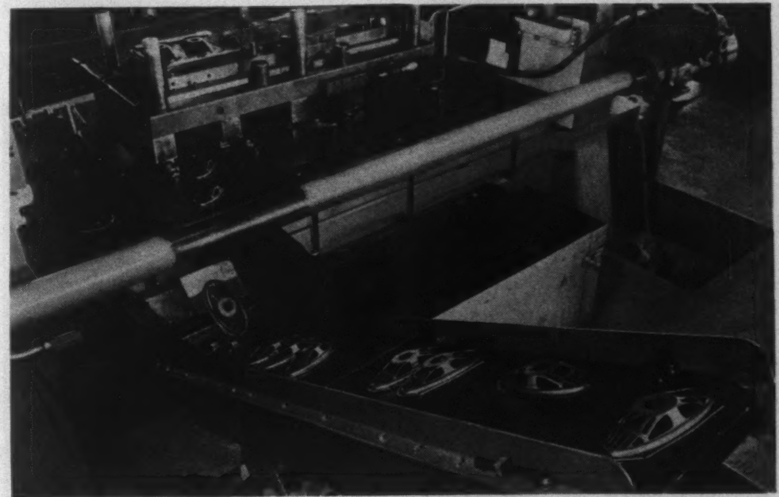
Optimum Speed — This clutch-location feature makes it possible to operate at high speeds, from 25-50 strokes per minute. The variable-speed range lets Magnavox match the stroke rate to die and part-size needs.

Twin gears reduce crankshaft torsion. They also boost the press capacity at points above the bottom of the stroke.

During the building and delivery



THOROUGH PLANNING, Members of production-engineering team study the fruits of their labor. F. J. Henry, team chief, reports good results.



AIR EJECTION: Seven progressive dies produce one finished part per stroke. At last stage, part is cut loose and air-ejected to conveyor.

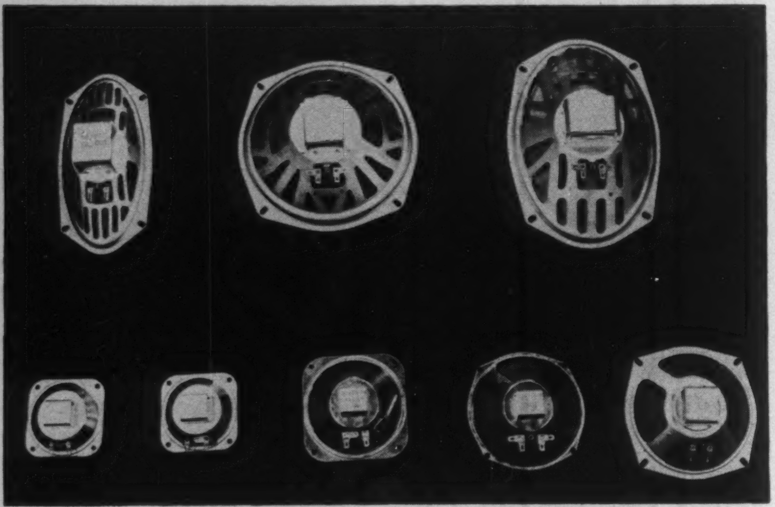
cycle of the press, the Magnavox engineering team wasn't idle. Each person concentrated on his own portion of the program.

Mr. Henry conducted the overall coordination of the project. He handled all liaison work. His plant engineer, Jewell Holt, spent several days at the Minster plant while the press was being completed. Mr. Holt studied the assembly procedure; then he made installation plans.

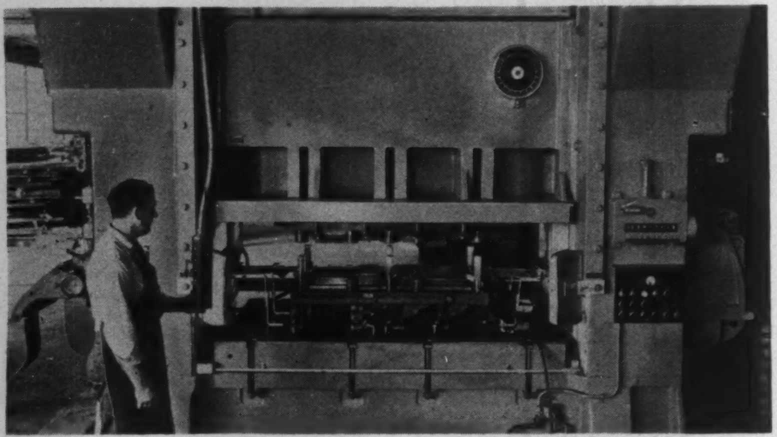
Develop Progressive Dies—A. H. Oldham, tool engineer, made full use of the press-construction and erection periods. Working closely with tooling vendors, he designed the progressive dies needed for the new press.

When the dies were ready, a die setter checked them out. He also ran actual production on the press for 30 days, prior to releasing the new unit. Why was this done? It made the die setter familiar with all die-setting phases, and it also increased his knowledge of the overall program.

After six months of using the new progressive die-stamping process, Magnavox reports: a 50 pct reduction in per part costs; 90 pct less die maintenance; 20-30 pct material savings; 600 pct savings in direct labor; 75 pct savings in die set-up time; and greater parts accuracy.



WIDE RANGE: Conehousings for loudspeakers are made in many sizes.



NO MAINTENANCE?: Dies form up to 240,000 parts without regrinding.

Mr. Henry also says that the strength and the appearance of the conehousings are improved.

Boosts Production—The average cost of stamping a conehousing has been cut in half. This allows a cut in the selling price. It also boosts plant productivity—resulting from increased sales and more manhours of worthwhile labor.

Seven men used to make 625 parts per hour. Now, one man produces 1800 parts per hour. This automation hasn't reduced the labor force. Due to the increased sales, Magnavox now employs more people at its Paducah plant.

The progressive die process allows better use of material. Thus, the overall program cuts down scrap and other waste.

Die life is very good. For example, even after a run of 240,000 parts, the progressive dies didn't need to be ground.

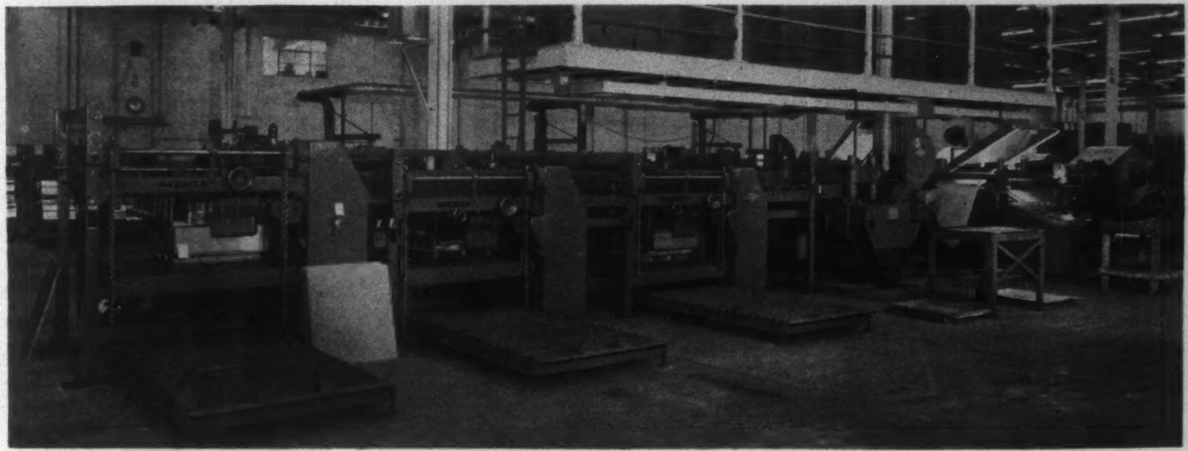
Fast Changeovers — Due to the varying sizes of parts needed to match assembly schedules, Magnavox's stamping runs center on job lots. Normal runs range from 50,000-100,000 parts. This calls for frequent die changes.

With the new press and the progressive dies, Magnavox needs only 25 pct of the die set-up time formerly required to set up the seven, separate, individual-operation dies. Now, one man sets the feed on the press, while waiting for the new setup.

Actual production time for the new press ranges from 48-51 minutes per hour. This rating is based on a full production week.

The precision of the Minster press and the progressive tooling increase the accuracy of the parts. Strength and appearance are also improved. These benefits show up in final assembly.

Rejects are almost unheard of, and the loudspeakers fit together with greater precision. This improves final product quality. It insures reliable service to customers at lower costs.



INSPECTS AND PILES—The automatic classifying unit handles both aluminum and tinplated coils. System detects flaws regardless of size. Memory circuits classify sheet stock before it enters the system.

Automated Unit Inspects Coils

Quality control and materials handling equipment can work hand in hand to defray the burden expenses.

Automated classifying systems inspect, shear and pile materials directly from the coils.

▪ Checking the quality of jar and bottle cap materials such as tinplate and aluminum is necessary to guarantee good vacuum standards. Just how the check is made, though, is an important factor in saving time and money.

The Crown and Closure Div., Crown Cork and Seal Co., Inc., Baltimore, finds that its new automatic inspection and sorting lines really pay off. The quality-minded units make use of memory circuits to classify sheet stock before it hits the system.

More automation is seen on decorating lines and punch press lines. Once the aluminum or tinplate sheet receives approval, it's transferred to the metal decorating line. There it receives a combined coating and lithographing operation.

Checks Aluminum and Tinplate—The classifying unit works from coils. As it unwinds, it's passed through a leveler and then a thickness gage. If the gage detects a section of the web either over or under standard, it notifies a memory device which directs it to a piler that handles rejected stock.

Once past the thickness gage, the aluminum or tinplate receives a visual inspection. At this station, mirrors are located over and under the material. The web continues on to another automatic inspection station where it is checked for pinholes. If a light beam passes through the sheet it notifies the memory device for rejection.

Next step is the cutting of sheets to various sizes by means of a reciprocating shear. An elevated tray enables the operator to pull any given sheet without blocking the whole classifying process.

By merely pressing a button, he can deflect the sheet into the tray for examination. From the shear the sheets move on to the piling section.

Separates Good From Bad—Engineered by The Dexter Co., Pearl River, N. Y., the pilers can be used interchangeably. The three pilers are set up so that at any given time two are in use—one for good sheets and one for rejects. The third piler is unloaded and placed on standby, ready for a new load. Automatic counters total up the good and bad sheets.

Each piler has an elevator platform which indexes downward as it collects the sheets on skids. When fully loaded, the skid is rolled off the platform onto conveyors.

Feeders Raise Capacity — The decorating and punch press operations that follow the inspection process raised their load capacity to 9000 lb with automated feeders. Suction cups and magnets handle both ferrous and nonferrous stock.

Suction cups lift the top sheet while an air blast blows under the sheet to separate it fully from the pile. The cups then pivot to advance the sheet to a coater "infeed" conveyor. Tinplate gets an assist from permanent magnets located near the top of the pile. The magnetic field set up in the top sheets causes them to almost float from the pile.

NO FORMING PROBLEM: Three grades of the constructional steel series are bent without cracking.

New Alloys Combine Strength With Ease of Fabrication

Most people know that you can't get something for nothing. Boost a steel's yield strength, and the ductility drops.

A "restrained quench" retains the formability of a new group of high-strength alloys.

▪ A new group of constructional steels combines high strength with welding and forming ease. These steels permit builders of heavy-duty defense and industrial equipment to beef up the strength of their products — while affecting savings in time and fabrication expenses.

Jalloy-S is the trade name of the new steel series. These high-strength steels, developed by the Jones & Laughlin Steel Corp., Pittsburgh, are expected to serve in diverse fields.

Dual Series—Potential uses include: missiles, off-the-road construction machinery, ordnance equipment, hoists, cranes and other industrial parts. Future uses will also include heavy trucks and farm machinery.

A companion series, Jalloy-AR, boosts working limits for abrasive resistance at high yield-strength levels. J&L expects the Jalloy-AR steels to serve in equipment for the mining, transportation and construction industries, among others.

Both of the new steel series derive their properties primarily from special heat-treating, quenching and tempering methods.

Restrained Quench — Jalloy-S steels are heated to 1600°-1650°F: This allows them to homogenize. At this heat, the steels are water quenched. Quenching takes place while the steels are held in a platen press, to maintain flatness.

Cooling to room temperature occurs within 90 seconds. Then tempering or draw treatment follows at 1150°-1200°F. This follow-up action relieves internal stresses. It also adjusts the mechanical properties to the desired level.

Fabrication of Jalloy-S steels calls for more attention than mild steels. The high strength must be considered when cold forming takes place, because the newcomer's yield strength is three to four times that of mild steel.

Maintains Hardness—Properties of Jalloy-AR steels are obtained through similar heat treatment. However, for this series the tempering heat remains between 700°-1000°F. This heat relieves stresses and adjusts the hardness to the desired level.

Jalloy-S constructional steels are

available in three grades. The exact nomenclatures are Jalloy-S-90, Jalloy-S-100 and Jalloy-S-110. The numbers represent the minimum yield strength in thousands of pounds per square inch.

Of course, steels with higher yield strengths are well known, but the Jalloy-S steels have other advantages. Despite their strength, the new steels are easily welded and formed.

Weldability and ease of fabrication are important features of the Jalloy-S steels. These properties, combined with high strength and good notch toughness, provide fabricating-cost and weight reductions. These advantages account for the extensive use of the three grades.

Ready to Roll—Commercial production of Jalloy-AR steels will begin shortly. This series will be produced in two sets of hardness values. Jalloy-AR-360 will have a Brinell hardness rating from 340-380. The minimum hardness rating of Jalloy-AR-400 will be 400 Bhn.

Typical yield strength for both of these abrasive-resistant steels is 140,000 psi or better. J&L metallurgists believe that the Jalloy-AR steels surpass any steel product now available for abrasive-resistant use.

No Machining Problem—It's no problem to machine any member of the new steel series with high-speed or carbide-tipped tools. However, due to the hardness and toughness, machining speeds have to be adjusted.

Normal welding methods join the new steels. To preclude underbead cracks, hydrogen must be prevented from entering the welded joints. Pre-heats aren't normally needed. J&L recommends the following electrodes: low hydrogen AWS Spec. E-100XX, E-110XX and E-120XX.

The new steels will make their debut in a wide variety of forms. J&L says these forms will include hot-rolled sheets, bars and plates. A wide range of sizes will also be marketed, the company adds.

STRONG WELDED JOINT: New constructional alloy is easily welded. Joint withstands 180° side bend. Minimum yield strength is 90,000 psi.

Alloys Have Good Mechanical Properties

Grade Designation	Yield Strength, psi	Tensile Strength, psi	Elongation, pct in 2 in.	Reduction in Area, pct	Hardness, Bhn
Jalloy-S-90	92,700	100,100	20.0	61.5	241
Jalloy-S-100	107,000	115,000	18.5	60.0	255
Jalloy-S-110	114,000	122,000	17.0	60.0	269
Jalloy-AR-360	140,000	155,000	15.0	55.0	360
Jalloy-AR-400	165,000	180,000	14.0	55.0	400

Abrasive-Resistant Alloy Withstands Heat

Temp., °F	Yield Strength, psi	Tensile Strength, psi	Elongation, pct in 2 in.	Reduction in Area, pct
75	147,000	162,000	15	52
400	145,000	162,000	15	52
600	138,000	167,000	13	58
800	120,000	142,000	7	75
1000	90,000	103,000	6	78

Note: Tests conducted on Jalloy-AR-360, 1-in. plate.

Turners Hold Close Tolerances

During the Korean War, slow production of jet-aircraft parts led to the development of a high-production vertical turner.

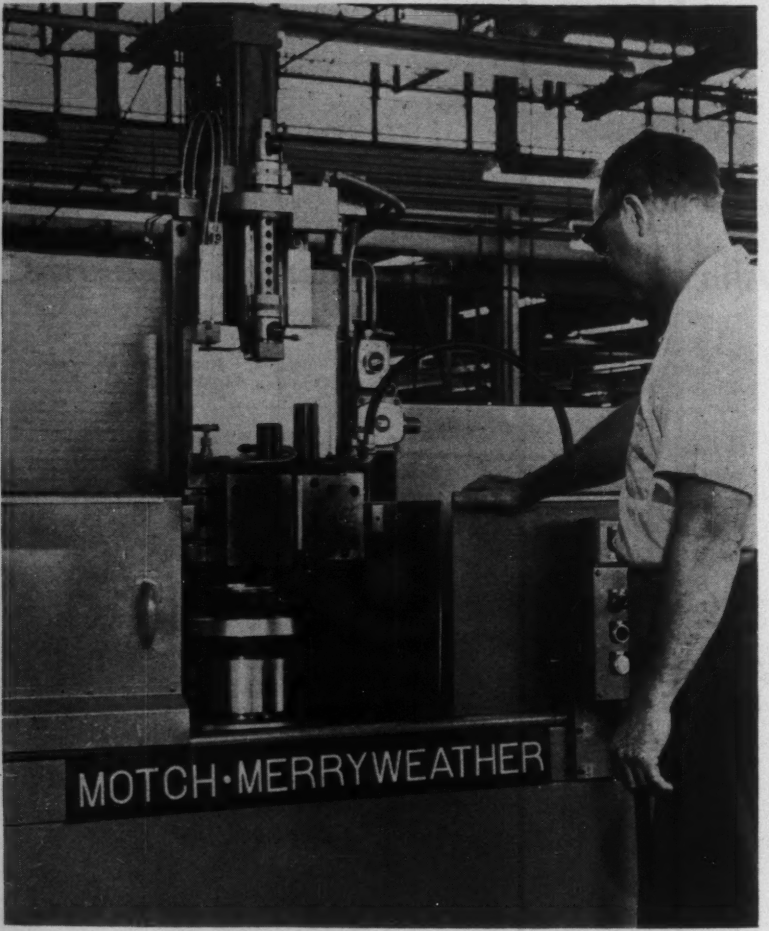
After a period of dormant interest, the time-cutting turners are now making a strong comeback.

▪ At the start of the Korean War, 2-ft tapered disks were in dire need for jet-aircraft engine-blade roots. Vertical boring mills or lathes were turning them out laboriously. Each machine could make about one disk per shift.

To break the bottleneck, Motch & Merryweather of Cleveland developed a compact vertical turner. It machined the disks in 30 minutes each with a single chucking.

A Welcome Return—After the Korean War subsided, interest in these vertical mills died down. However, development continued. Now it is finding its way back. Lighter and far more versatile models have come on the horizon. Some of the improvements include two spindles and up to three vertical columns.

The Hoern & Dilts Div. of New Britain Machine Co. has about 60 single-tooling machines turning gear parts at an auto transmission plant. Others are in missile work. The Sundstrand Machine Tool Co. is adapting a vertical, automatic brake-drum production lathe to do profile work.



FAST AND CLOSE: Accurately turning and boring bevel drive gear blanks, a vertical turner replaces an 8-spindle vertical turret lathe.

The Motch & Merryweather turner handles such widely-varying work pieces as pistons, crankshafts, transmission housings and ring gears. They chuck vertically at a single time.

Good Replacement — The new units are fast proving themselves in jobs normally done on other machines. At Eaton Mfg. Co., Axle Div. in Cleveland, three vertical turners are boring and turning bevel gear blanks to tolerances of 0.0003 in. to 0.0005 in. where requirements are ±0.001 in. Previously, the work was done on vertical turret lathes.

At a Detroit auto plant, three machines finish bore and face flywheel assemblies. Also, in a missile plant, two Hoern & Dilts units took over the work of 18 engine lathes.

An electric-motor manufacturer in Cleveland uses a two-spindle Hoern & Dilts unit. It replaces a stub lathe and precision boring machine. It sets up in less than an hour, compared to 2¼ hours for the two previous machines.

This unit turns out bearing cartridges for electric motors. Dimensions are critical for proper bearing and shaft alignment. It works to tolerances of 0.0005 in. doing the finishing work on the bearing bore, outside diameter and faces.

Between Korea and the present, many new design refinements were conceived, but there were few jobs specialized enough to arouse much interest. Now, however, the veteran of the Korean war has a bright future for itself in machine-tool circles.

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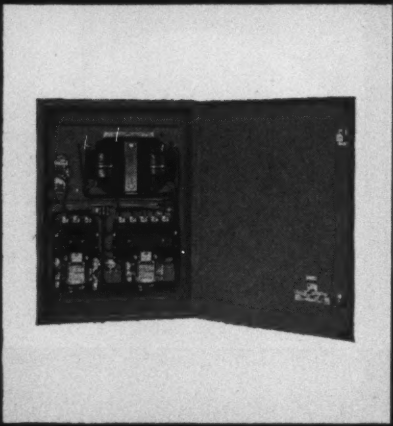

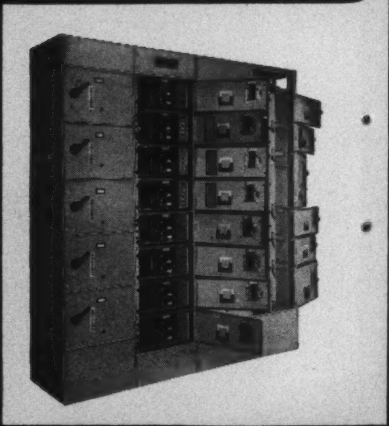

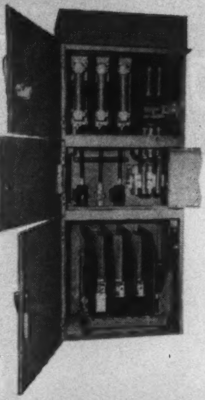

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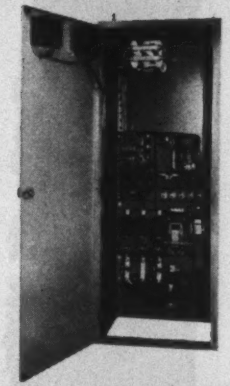

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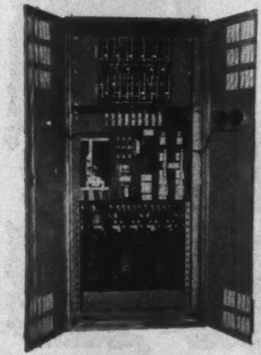

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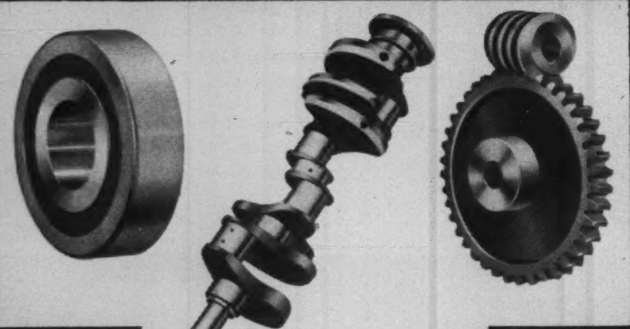

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Tectyl rust preventives meet exacting government specifications.

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VALVOLINE
Tectyl RUST PREVENTIVES

VALVOLINE OIL COMPANY, Freedom, Pennsylvania
Division of Ashland Oil & Refining Company

PATENT REVIEW

New Patents In Metalworking

Self-Cleaned Grate Bar

Grate bar for sintering apparatus, W. Veith (assigned to Metallgesellschaft A.G., Frankfurt on the Main, Germany), Aug. 16, 1960. Design for a self-cleaning grate bar for sintering machine carriages or bands. No. 2,949,289.

New Ferroalloy

Ferrochromium-aluminum alloy, J. H. Brennan and E. R. Saunders (assigned to Union Carbide Corp., New York), July 26, 1960. A high-carbon ferrochromium alloy, mixed with an oxygen-containing oxidizing agent, forms an exothermic alloy addition mixture. The ferrochromium alloy consists of 5-25 pct Al, 45-70 pct Cr, up to 10 pct Si, 0.2-5 pct C, and the remainder Fe. No. 2,946,676.

Makes Oil Holes

Manufacture of metal stock having internal holes, C. F. Sawyer, Jr. (assigned to Vanadium-Alloys Steel Co., Latrobe, Pa.), Aug. 16, 1960. Improved method for making accurately located and dimensioned oil holes in metal stock, especially drill bar stock. No. 2,948,957.

Regulates Molten Flow

Process of making ladle stopper heads, M. O. Holowaty and A. M. Kroner (assigned to Inland Steel Co., Chicago), Aug. 23, 1960. Method for making a clay-graphite ladle stopper head. It is for use in combination with a bottom-pour delivery nozzle to prevent and regulate the flow of molten metal through the nozzle. No. 2,949,637.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

519
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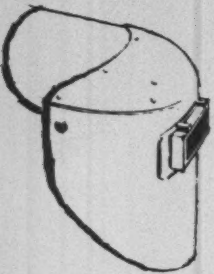


NO. 7 OF A SERIES

"How to Design Welded Aluminum Structures"

New Design Specifications for Welded

Mr. Harry N. Hill,
Engineering Design Division Chief,
Alcoa Research Laboratories,
Aluminum Company of America, reports findings presented at the 1959 annual meeting of the American Society of Civil Engineers.

New recommended design rules for a number of the more important aluminum alloys being welded today have been prepared by Alcoa. These rules are based on the results of continuing investigations at the Alcoa Research Laboratories and have led to the new concepts of strength of welded aluminum that have been discussed in previous articles in this series.

While *complete* design rules are not possible in this space, the table at right lists the recommended basic allowable stresses for some of the most important alloys and tempers. (Complete rules for welded structures of 5456-H321 were presented at the 1959 annual ASCE meeting. Free copies available from Alcoa on request.) Values are for the types of structures that would be designed in steel according to AREA, AASHO or similar specifications. Allowable stresses would be about 12 per cent higher when designing structures such as those done in steel according to AISC or similar specifications. Allowable stresses *can*, of course, be adjusted to *any* desired safety factor.

The recommended allowable stresses are based on minimum mechanical properties and conservative values of minimum expected weld strength, as discussed in earlier articles in this series. Higher allowable stresses may be justified where a given welding technique gives consistently higher weld strengths.

A brief examination of the table reveals that the evaluation of the allowable stress expressions requires only the simplest arithmetic. Nomographs, such as Fig. 1 for alloy 6061-T6, make such evaluation even easier.

Allowable stresses given in the table for compression, and for shear in plates and webs, are for cases in which buckling is not involved. If strength is controlled by buckling, allowable design stresses are obtained from families of curves such as those shown in Fig. 2 for welded 6061-T6 columns and beams. Similar Alcoa charts give design stresses for buckling of plates and webs.

The final article of this series will discuss the fatigue strength of welded joints in aluminum alloys.

For top-quality aluminum welding products such as consumable electrodes, welding and brazing rods and fluxes, and solder and soldering fluxes, contact your nearest Alcoa sales office. For complete information on "Designing Welded Aluminum Structures," write Aluminum Company of America, 1761-J Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM

WELDING MATERIALS

Developed by Alcoa
Aluminum Alloy Structures

Recommended Allowable Stresses for Welded Aluminum Structures

Factor of Safety on Yielding=1.85
Factor of Safety on Ultimate Strength=2.20
Stresses are in kips per square inch

Alloy and Temper	Filler Alloy	Product	TENSION	COMPRESSION	SHEAR			
					(Plates and Webs)†		Fillet Welds	
			Beams and Members Under Axial Load	(Beams and Members) (Under Axial Load)†	Welded	Not Welded	Longitudinal	Transverse (Symmetrical)
5456-H321	5556	Sheet and Plate	$17.8-7.6\frac{A_{rl}}{A}-3.8\frac{A_{rt}}{A}$	$17.2-7.0\frac{A_{rl}}{A}-3.2\frac{A_{rt}}{A}$	8.1	10.3	9.1	14.5
5456-H343	5556	Sheet	$22.2-11.9\frac{A_{rl}}{A}-8.1\frac{A_{rt}}{A}$	$21.1-10.8\frac{A_{rl}}{A}-7.0\frac{A_{rt}}{A}$	8.1	13.0	9.1	14.5
5456-H311	5556	Extruded Shapes	$13.5-3.2\frac{A_{rl}}{A}-1.1\frac{A_{rt}}{A}$	$11.9-1.6\frac{A_{rl}}{A}-0.5\frac{A_{rt}}{A}$	7.0	7.6	9.1	14.5
5454-H34	5554	Sheet and Plate	$15.7-9.2\frac{A_{rl}}{A}-7.0\frac{A_{rt}}{A}$	$14.6-8.1\frac{A_{rl}}{A}-5.9\frac{A_{rt}}{A}$	4.9	9.2	6.4	8.6
5454-H311	5554	Extruded Shapes	$10.8-4.3\frac{A_{rl}}{A}-2.1\frac{A_{rt}}{A}$	$9.7-3.2\frac{A_{rl}}{A}-1.6\frac{A_{rt}}{A}$	4.9	5.9	6.4	8.6
5086-H34	5556	Sheet and Plate	$18.4-10.8\frac{A_{rl}}{A}-8.1\frac{A_{rt}}{A}$	$16.8-9.2\frac{A_{rl}}{A}-6.5\frac{A_{rt}}{A}$	5.9	10.8	9.1	12.3
6061-T6	5556	Sheet, Plate, Extruded and Rolled Shapes	$\left[\begin{matrix}18.9-13.0\frac{A_{rl}}{A}-10.8\frac{A_{rt}}{A}\\ \text{or}\\ 17.3-7.3\frac{A_r}{A}\end{matrix}\right]^*$	$18.9-13.0\frac{A_{rl}}{A}-10.8\frac{A_{rt}}{A}$	4.9	10.8	9.1	9.1

A=Net area of cross section A_{rl}=Reduced-strength area of cross section due to longitudinal welds A_{rt}=Reduced-strength area due to transverse or localized welds
$A_r=A_{rl}+A_{rt}$

† When strength is not controlled by buckling

* Use whichever value is lower

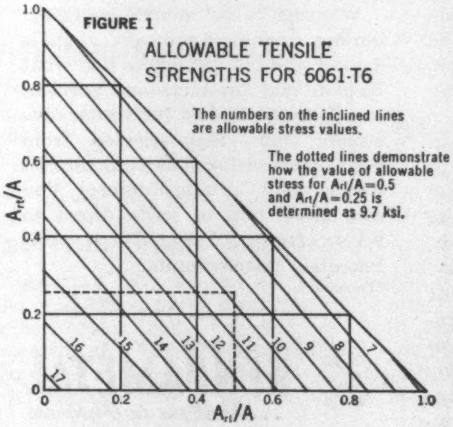


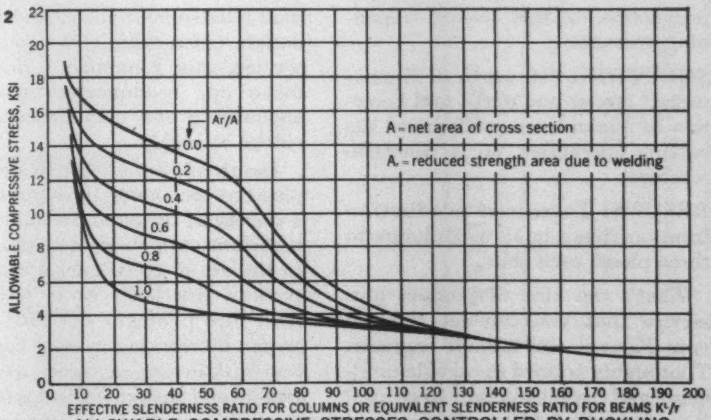
FIGURE 1

ALLOWABLE TENSILE STRENGTHS FOR 6061-T6

The numbers on the inclined lines are allowable stress values.

The dotted lines demonstrate how the value of allowable stress for $A_{rl}/A=0.5$ and $A_{rt}/A=0.25$ is determined as 9.7 ksi.

FIGURE 2



ALLOWABLE COMPRESSIVE STRESSES CONTROLLED BY BUCKLING, FOR WELDED COLUMNS AND BEAMS OF ALLOY 6061-T6

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3-man team solves operating problem

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PROBLEM: Required increased production on this 30-foot trepanning operation.

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New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Machine Tools

Described in a 52-page catalog is a complete line of light-heavy-weight machine tools and accessories. Some of the industrial tools described are drill presses, grinders, cut-off machines, band saws and belt and disk surfacers. (Rockwell Mfg. Co.)

For free copy circle No. 1 on postcard

Threading Tools

A 44-page bulletin describes and illustrates a complete line of threading tools. Also covered are specifications, parts lists, ordering instructions and thread data. (National Acme Co.)

For free copy circle No. 2 on postcard

Ball-Bearing Units

High-quality ball-bearing units are presented in a catalog. The literature features comprehensive technical and engineering data, specifications, diagrams, illustrations and typical applications of the popular line of ball bearings. (Stephens-Adamson Mfg. Co.)

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Strip-Mill Scrubber

Various types of strip-mill scrubbing equipment are illustrated and described in a 2-page bulletin. (Hanson - Van Winkle - Munning Co.)

For free copy circle No. 4 on postcard

Electrode Wall Chart

Measuring 23 x 35 in., an electrode wall chart gives description, number, color code, mechanical properties, size, current range, procedure and application information on a complete line of arcwelding electrodes. Other valuable welding information is covered. (Hobart Bros. Co.)

For free copy circle No. 5 on postcard

Speed Lathe

A bulletin illustrates and describes a precision speed lathe. The bulletin highlights five company "firsts," with particular emphasis on the new "one motion control." (Rivett Lathe & Grinder, Inc.)

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Automatic Roll Feeds

The complete range of sizes and capacities of automatic roll feeds is described in a catalog. Also included are its many outstanding features. (Durant Tool Co.)

For free copy circle No. 7 on postcard

CO_2 Used in Welding

The uses of carbon dioxide (CO_2) in the welding industry are reported in a brochure. Liberally illustrated, it covers the characteristics of CO_2 gas-shielded metal-arc welding of mild steel and low alloy steel; also, the advantages of CO_2 in welding, and the various welding processes employing carbon dioxide as a shielding gas. (Pure Carbonic Co.)

For free copy circle No. 8 on postcard

Rare Earths

Technical data on the catalytic properties of rare earths are included in data sheets. (Vitro Chemical Co.)

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Vibration Control

Engineering specifications and performance data, for 27 types of products for the control and measurement of machinery vibration, shock and noise, are given in an eight-page booklet. Actual installation photos show a variety of equipments and tell how typical problems were solved. A special feature is the easy-to-read selector chart covering a wide range of

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FREE LITERATURE

equipment, showing recommended and alternate methods of isolation. (The Korfund Co.)

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Silver Alloy Brazing

At-home or in-plant training in silver brazing is the subject of a bulletin. The bulletin describes in detail the new packaged, self-study silver brazing training course. The brochure lists and illustrates the complete contents of the packaged self-study course. (Handy & Harman)

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Coal Handling

Coal-handling applications for the manufacturer's "long-stroke" air vibrators are dealt with in a bulletin. The four-page bulletin shows installation pictures and application data. (National Air Vibrator Co.)

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Fasteners

Automatic stapling and tacking equipment, including the latest additions to the line, are described and illustrated in a 32-page catalog. The catalog describes, with on-the-job photos, the many uses to which the tools are put. (Fastener Corp.)

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Gages, Thermometers

Pressure gages, thermometers and control instruments are described in a six-page bulletin. Photographs illustrate each of the ten types of gages covered. Included under temperature measurement are dial and glass tube thermometers, panel type and multi-angle thermometers. (United States Gage)

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Vacuum Coatings

Custom vacuum coating services, for functional and unusual decorative purposes, is the subject of a four-page brochure. (Poly-Kote, Inc.)

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Speed Reducers

Technical information on shaft-mounted, geared speed reducers is contained in a brochure, as well as illustrations. Also included are feature descriptions and selection and ordering instructions. Tables are included. They show the service classifications to be applied in determining the types of speed reducers to be used in numerous industrial applications and under various conditions of usage. (U. S. Electrical Motors Inc.)

For free copy circle No. 16 on postcard

Super Alloy Steels

Technical data, on the consumable electrode method of vacuum melting super alloy steels, are contained in a booklet. The book is written in factual style to supply metallurgists, design engineers and research and development men with the latest factual data on vacuum melting and the advantages of metals produced by this method. (Midvale-Heppenstall Co.)

For free copy circle No. 17 on postcard

Spot Welding

The equipment and procedures recommended for spot welding hardenable steels are given in an eight-page brochure. Weld quality is classified, and data charts summarize the welding schedules used on various steels. Step by step instructions are included for set-up, welding and testing. (The Taylor Winfield Corp.)

For free copy circle No. 18 on postcard

Honing

Internal, external and straight line honing are described in a 16-page catalog. The development of honing and the honing process are explained. Typical honed parts are illustrated. Charts list spindle speeds and coolants for various honing operations. (Barnes Drill Co.)

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Warm Air Heater

The company's line of warm air heaters, for industrial and commercial use, is covered in an eight-page catalog. There are plan and dimension drawings of all models, as well as halftone illustrations of the equipment. Specifications are listed for all models. (Wanson Corp.)

For free copy circle No. 20 on postcard

Pallet Handling

A handy, digest-size booklet describes pallets and their uses. The book illustrates different types of pallets and explains their uses. The advantages of wood and metal pallets are listed. (Raymond Corp.)

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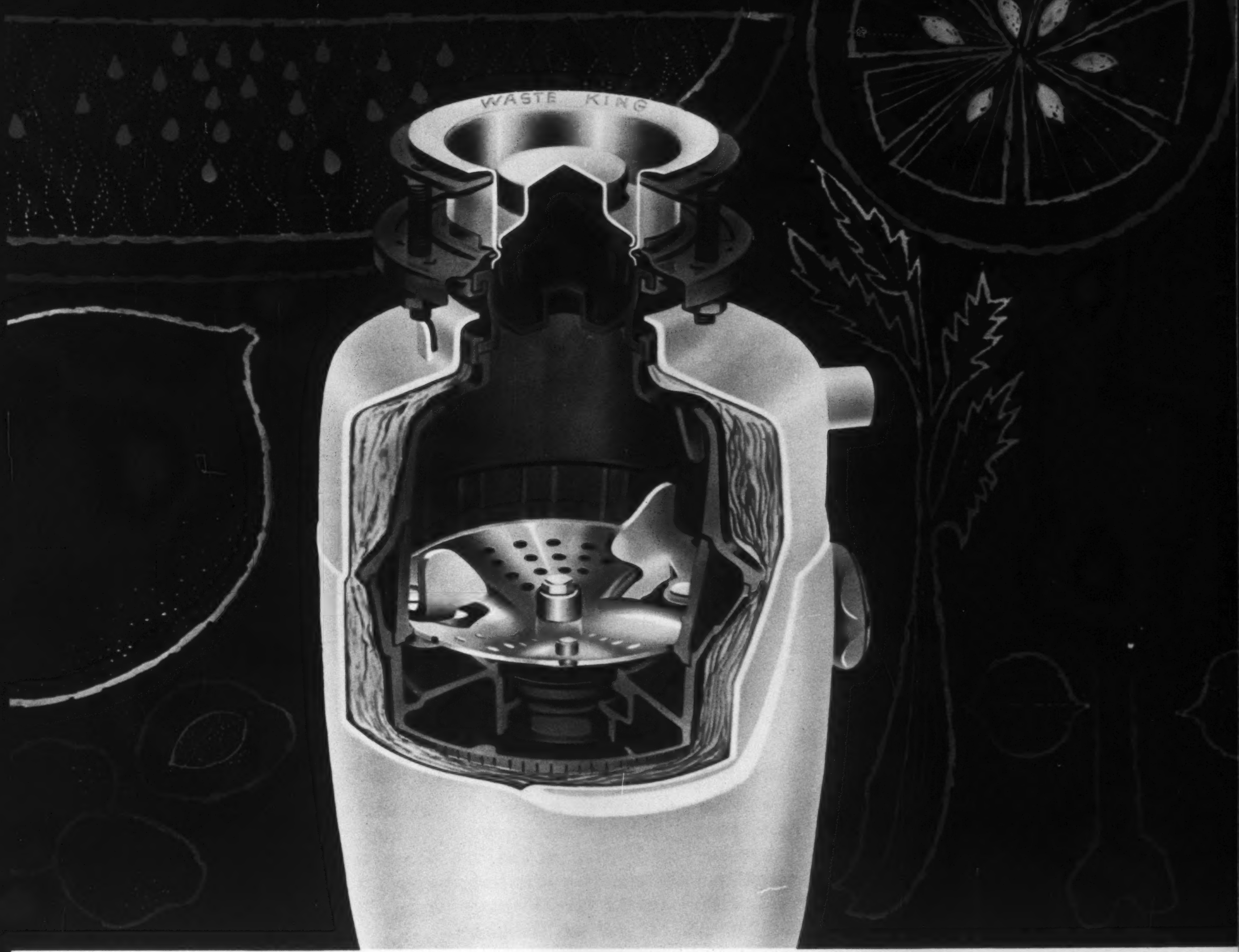

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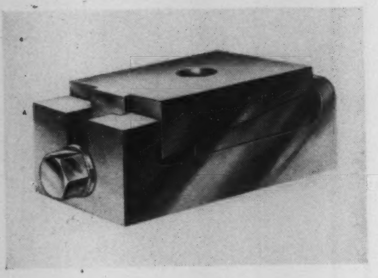
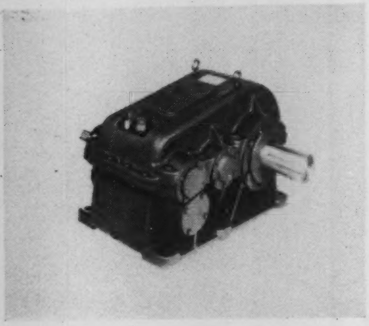


Leveling Jacks Control Without Lateral Movement

With capacities to 20,000 lb, adjustable leveling jacks give precise level installation of machine tools, automation lines and other toolroom equipment. The units permit up to ¼-in. vertical adjustment. They feature two inter-acting inclined planes which give smooth upward or downward control with no lateral movement. Although designed for use at corners, centers, or along entire machine base, the levelers can be installed wherever equipment needs support. (Enterprise Machine-Parts Corp.)

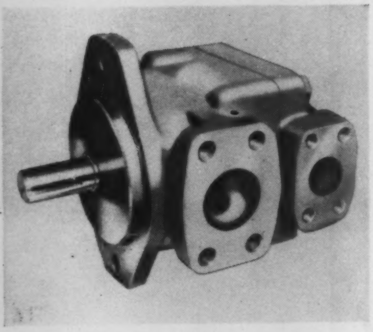
For more data circle No. 22 on postcard, p. 135



Speed Reducers Permit Savings in Drive Costs

With a variety of sizes to choose from a line of speed reducers, it is possible to make a closer match of drive selections to horsepower requirements. Single, double and triple reduction units come in capacities up to 2800 hp; at high or low output speeds and ratios up to 292:1. Shafts can be arranged to suit specific drive requirements. Unusual design allows assembly with single shaft projections in either direction or with double shaft projections. The "balanced design", parallel-shaft speed reducers have extra-tough welded steel housings that withstand severe external abuse. (Link-Belt Co.)

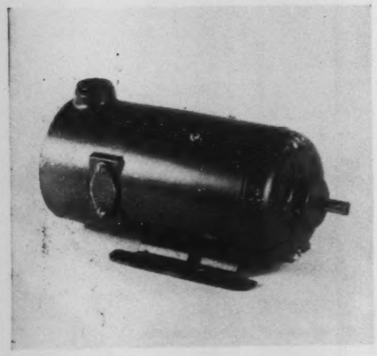
For more data circle No. 23 on postcard, p. 135



Rugged Vane Pumps Require No Drain Line

Efficient and compact, a series of vane pumps operates continuously at pressures up to 2500 psi and at speeds to 2500 rpm. They are rated at 8, 11, 14 and 17 gpm, rotating at 1200 rpm and at 0 psi. The port plate is free to move axially within limits. This permits cold starting and pressure loading of cartridges for high volumetric efficiencies. Any leakage in the pump is circulated back to suction. To simplify installation, the pump has a standard 2-bolt "C"-type, SAE mounting flange. The end cap rotates to any one of four positions. Port pads match 4-bolt SAE port pads. (Denison Engineering Div., American Brake Shoe Co.)

For more data circle No. 24 on postcard, p. 135



Tachometer Generators Feature Rugged Design

Easy to install, ac and dc tachometer generators provide speed indication for nearly any machine tool or industrial process application. The applications can involve speeds up to 5000 rpm. The units' base mounting dimensions are highly adaptable to a variety of machine tool applications. A roomy terminal box simplifies installation. The box comprises the entire opposite-pulley-end of the generator. A shaft diameter of 5/16 in. makes shaft strength roughly three times that of former models. The units have six poles. As a result, minimum full-scale speeds may range as low as 0-300 rpm with suitable accuracy. Both ac and dc units have rated outputs of 20 v per 1000 rpm. (General Electric Co.)

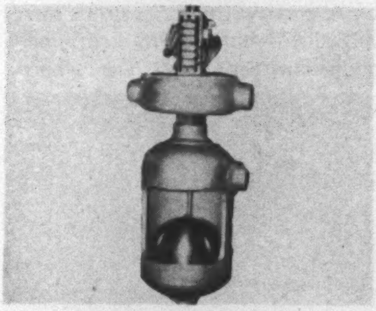
For more data circle No. 25 on postcard, p. 135

Linear Display System

A linear display system features full-range electronic origin selection and absolute display of actual cutting tool or workpiece position. This numerical control system is specially designed for adaptation to existing as well as new machines. The unit automatically performs calculations for rotary and linear positioning. It utilizes an unusual position feedback transducer, electronic circuitry and a visual display to indicate the actual position of the tool or work piece. (Norden Div., United Aircraft Corp.)

For more data circle No. 26 on postcard, p. 135

Controls Liquid Level



In most locations where vibration and corrosion are serious problems, a single-stage, external float cage-style control provides liquid-level control. It can be either electrically or pneumatically switch operated. (Magnetrol, Inc.)

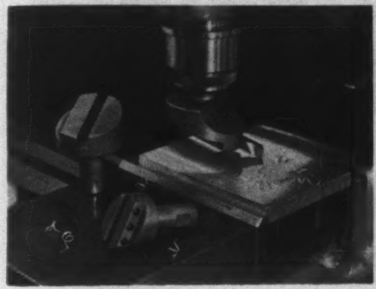
For more data circle No. 27 on postcard, p. 135

Paint-On Solder Paste

The formulation for paint-on solder pastes combines an exact balance of alloy and flux. It gives long shelf life without metallic elements settling, without flux separating; and without hardening in the jar. (Eutectic Welding Alloys Corp.)

For more data circle No. 28 on postcard, p. 135

Cutter Holders



Fly tool cutter holders feature a counterbalanced holder. This allows faster speeds and feeds, and finer finishes. Using 5/16-in. carbide or high-speed tool bits, the holders are ideal for rapid stock removal; also, smooth finishes up to 6-in. wide in one cut, instead of a series of cuts as with end mills. It also saves on end-mill costs and sharpening costs. Three-quarter inch shank size on holders makes the device adaptable to most vertical mills. (City Tool-Die & Mfg. Co., Inc.)

For more data circle No. 29 on postcard, p. 135

Cutting Fluid

Multi-metal cutting oils give the widest service range possible. They maintain high machining efficiency across-the-board in different operations. The new, patented phosphosulphurized additive combination, in the oils, controls the built-up edge as pressure-temperature conditions change due to operations or metals. This makes possible optimum machinability of different materials without changing oil. (Mobil Oil Co.)

For more data circle No. 30 on postcard, p. 135

Anti-Stick Agent

Easy to apply, a fluorocarbon slip and anti-stick agent provides a low-friction, dry film which is chemically inert, insoluble, and thermally stable to over 500°F. The resulting film is dry, non-gummy and will not collect dust. (Dixon Corp.)

For more data circle No. 31 on postcard, p. 135

Drill-Press Table

An all-purpose drill press table, fits all popular size bench or floor model drill presses. The table quickly installs on the drill-press column, and provides two cross slide movements together with 360° rotary feed and graduated tilting adjustment. Drilling, milling, grinding and indexing are only a few of the operations which can be performed without removing the work

"the HITCHINER way..."

. . . and non-machinable super alloys in INVESTMENT CASTING

These spray nozzles for highway striping paint sprayers were formerly machined out of cold rolled bar stock. When ordinary paint was used, these nozzles functioned satisfactorily. However, when ground glass was added to the paint for reflecting purposes excessive wear caused frequent replacement.

By "the HITCHINER way . . .", we were able to engineer the manufacture of this part by investment casting in a non-machinable type alloy exhibiting a very high degree of resistance to both wear and corrosion.

This change of alloy, which eliminated the need for frequent nozzle replacement, was made possible through investment casting because the required close dimensional tolerances and detail could be cast to size.

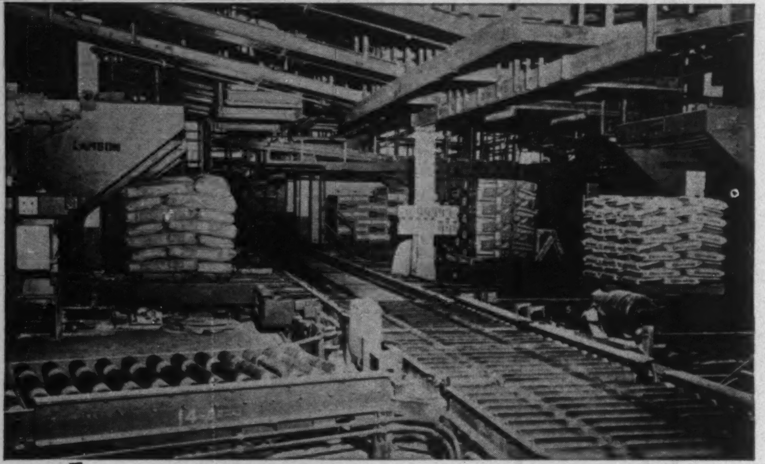
Through the wide freedom of choice in alloy, as well as through flexibility in design and the elimination of expensive machining operations, investment casting may possibly solve your metal parts manufacturing problems. Send us your sample or blueprint and find out with a Hitchiner "engineered quotation" — no obligation.

NO LIMITATIONS. From miniature ball bearing races to 20" Steam Turbine Impellers, "the Hitchiner way . . ." with investment castings can help you.

Send for our latest revised brochure and find out for yourself. It's free.

HITCHINER
MILFORD 18, NEW HAMPSHIRE
Coast to Coast Engineering Representatives

MECHANIZE...
PROFIT-WISE!
WITH
LAMSON ENGINEERED
CONVEYOR SYSTEMS



Automatic Palletization — the hub of a LAMSON engineered conveyor system linking production lines to warehouse.

You cut production time and the unnecessary handling of materials to the bone with the help of LAMSON engineers. They are specialists in developing materials handling systems that truly increase the capacity of your present buildings and dramatically increase the productivity of your present equipment.

There are more LAMSON custom engineered conveyor systems in successful operation today than any other kind. They are being serviced throughout their life by the same LAMSON field offices that initially analyzed the problem, proposed the solution and supervised the installation.

As a result of this complete, professional service you will find many of the finest names in industry among LAMSON installations. During the past 75 years LAMSON has been active in almost every field, yours included, and perhaps even in divisions of your own firm. LAMSON can cut costs; speed production; increase your profits.

If you have a materials handling problem, write LAMSON today for our conveyor catalog and the name of your nearest LAMSON Field Engineer. Or, simply clip this advertisement to your letterhead and mail to:

PIONEERS *the Conquest* OF INNER SPACE

LAMSON CORPORATION
904 Lamson Street, Syracuse 1, New York
PLANTS IN SYRACUSE AND SAN FRANCISCO • OFFICES IN ALL PRINCIPAL CITIES

Manufacturers of Airtube® (Pneumatic Tube Systems) • Integrated Conveying Systems • Pallet Loaders • Selective Vertical Conveyors • Bookveyors® Clinical • Trayveyors® • Food Service Systems • Blowers and Exhausters • Exidust® Central Vacuum Cleaning Systems • Dryset® Air Vacuum Systems

piece from the table. Installed in seconds, the table converts a drill press into an efficient and sturdy milling machine. (Chicago Tool & Engineering Co.)

For more data circle No. 32 on postcard, p. 135

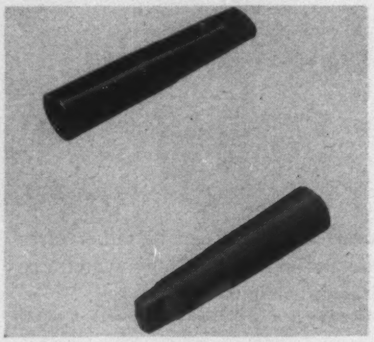
Electronic Relay

A highly-sensitive electronic relay requires only a few microamperes of current for operation. The device will actuate any electrically-controlled function of a process or a machine, such as size control or position control. (The Clark Controller Co.)

For more data circle No. 33 on postcard, p. 135

Nylon Drill Sleeves

For two different purposes, nylon drill sleeves come in two styles. The red nylon sleeve protects new drills. It prevents scoring of drill shanks and allows more accurate drilling production per tool. The white nylon sleeve gives new life to old drills. It can be used to accurately hold drills with broken or scarred shanks, and gives new life to tools that would otherwise be unserviceable. (American Twist Drill Co.)



For more data circle No. 34 on postcard, p. 135

Gage Guards

Made of a specially-developed, oil-resistant rubber product, gage guards protect the valuable investment in "Go" and "Not Go" ring thread gages. Shock is the greatest single cause of ring gage damage aside from wear. Flexible gage guards cushion the shock of accidental dropping or other rough contact which might change the gage setting and destroy its accuracy. The raised ridge of the guard protects the surface of the gage from scratches and dirt accumulation. (Geometric Tool Co.)

For more data circle No. 35 on postcard, p. 135

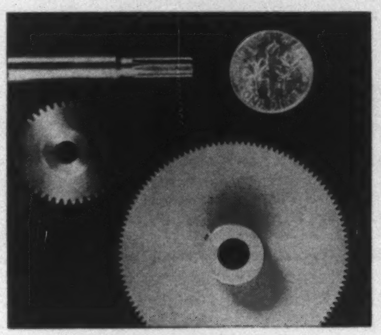
Cleans Solder Tips

A soldering-iron tip cleaner insures a clean tip after each soldering use. The device consists of a sponge holder, five slotted plastic sponges and a soldering iron bracket attachment to hold the tips up when the iron is not being used. One pass of the soldering iron through the wet sponges cleans the entire tip. (Macdonald & Co.)

For more data circle No. 36 on postcard, p. 135

Precision Gears

Precision gears meet space-age demands for dependable accuracy in gearing for miniaturized products. Each precision gear is certified to be AGMA Precision Class 1 or better. All materials and protective finishes conform to federal and military specifications. These small gears range from 1/10-2¼ in. in outside diameter. (Boston Gear Works)



For more data circle No. 37 on postcard, p. 135

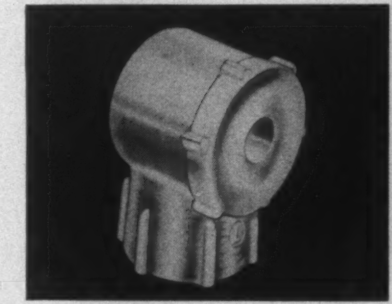
Hard-Facing Electrode

Equipment such as large sprockets, churn drills, drive tumblers, tractor grousers and most wearing parts subject to severe impact and abrasion, can be reclaimed with a manual electrode. Welding characteristics, ac or dc, are unsurpassed, with smooth arc action, low spatter and a slag covering readily removed, hot or cold. The rod is applied as stringer beads, in weaving passes or it may be dragged. The deposition rate is high. The electrode can be applied to carbon and low-alloy steels but is not suitable for welding on manganese steel or cast iron. (Stoody Co.)

For more data circle No. 38 on postcard, p. 135

Spray Nozzle

Made of a plastic, a spray nozzle is for use in cooling towers, evaporative condensers, spray humidifiers, air washers, spray ponds and other air conditioning and industrial applications. The nozzle is very durable and offers unusual heat resistance. The nozzle is specifically engineered to eliminate clogging. There are no vanes, cores or other obstructions in the nozzle. (Delavan Mfg. Co.)



For more data circle No. 39 on postcard, p. 135

Immersible Transducers

Immersible transducers tune themselves for top efficiency in ultrasonic cleaning. The transducers operate on a feedback sensing principle which eliminates the need for constant tuning of the cleaning equipment to suit changing load conditions. The immersible transducers are in dimensions designed to fit virtually any existing tank. (Powertron Ultrasonics Corp.)

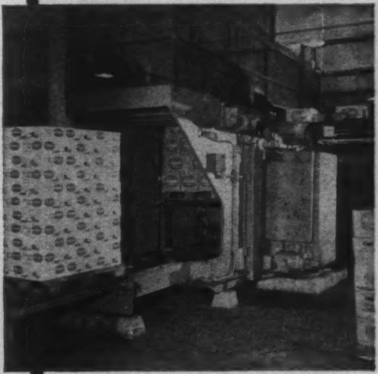
For more data circle No. 40 on postcard, p. 135

Fiber Glass Panels

Greater design latitude and economy, in use of reinforced plastics for intricately contoured parts, are being achieved through a new process. By this method, flat molded fiber glass panels are permanently formed into extreme and compound curvatures. Any wall thickness is

MECHANIZE...
PROFIT-WISE!

WITH A
LAMSON AUTOMATIC
PALLET LOADER



Gauged to handle any flow

Designed logically to receive the stepped-up mechanized flow of packaged goods from high speed production lines, the LAMSON AUTOMATIC PALLET LOADER provides the perfect link between packaging and warehousing.

Fast, accurate and dependable, the LAMSON AUTOMATIC PALLET LOADER performs a complex and variable operation for long periods of time with minimum maintenance.

Initial cost may be amortized out of savings the LAMSON AUTOMATIC PALLET LOADER effects in reducing man hours per pallet load and damage or breakage to packages.

Write for THE AUTOMATIC PALLET LOADER catalog. It may well be the answer to your particular materials handling problem. Or, simply clip this advertisement to your letterhead and mail to:

LAMSON

LAMSON CORPORATION
904 Lamson Street, Syracuse 1, N. Y.
PLANTS IN SYRACUSE AND SAN FRANCISCO
OFFICES IN ALL PRINCIPAL CITIES

Customer reports confirm...

CF&I Wire Packaging increases production, eases handling

In instance after instance, all across the country, manufacturers have reported cutting hours off daily downtime, easing storage and handling problems ... *increasing production as much as 50%* ... after they started using CF&I Steel Wire — Packaged for Your Production.

This is possible because all CF&I Wire is packaged specifically to give you one, or a number of special production or handling benefits. Several typical statements describing users' production benefits are reported here.

CF&I, the pioneer in wire packaging, makes wire in a wide range of gages and finishes. Whatever your needs, CF&I can fill them. Call your local CF&I sales office for full details on the Wire Packaged for Your Production.

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

In the West: **THE COLORADO FUEL AND IRON CORPORATION** — Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

CF&I OFFICE IN CANADA: Montreal

CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

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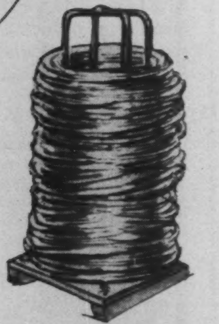
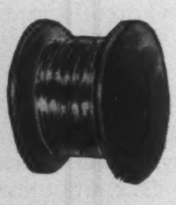
PACKAGED for YOUR PRODUCTION



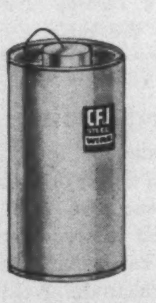
DISPOSABLE STEM-PAKS®
Capacity—500-1000 lbs.

Customer Report—
"50% increase in production since we started using Stem-Paks."



DISPOSABLE SPOOLS
Capacity—5-70 lbs.

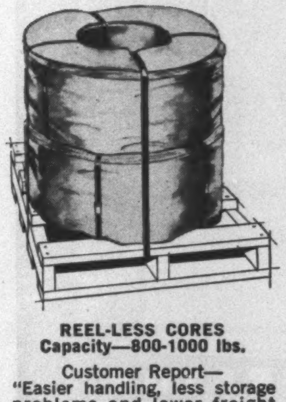
Customer Report—
"Easy to handle and store... quick to put in operation."



FIBRE DRUMS
Capacity—250-600 lbs.

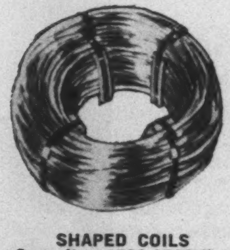
Customer Report—
"Wire protected from dust, rust and corrosive fumes. Easier handling, storage, inventory."

RETURNABLE SPIDERS: Capacity — 2000-3000 lbs. Customer Report — "25% increase in production, 20% less downtime and 80% less scrap loss with the long, uninterrupted pay-off of these returnable spiders." CF&I produces top quality wire in thousands of different types, sizes, shapes and finishes to meet all types of wire applications.



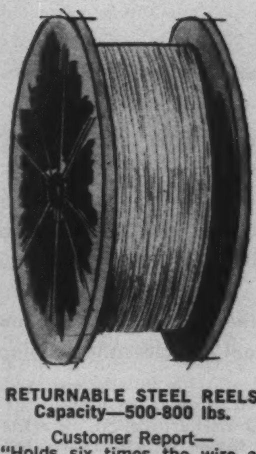
REEL-LESS CORES
Capacity—800-1000 lbs.

Customer Report—
"Easier handling, less storage problems and lower freight handling charges."



SHAPED COILS
Capacity—1500-2500 lbs.

Customer Report—
"20% increased production with longer runs, plus easier storage and reduced handling costs."



RETURNABLE STEEL REELS
Capacity—500-800 lbs.

Customer Report—
"Holds six times the wire as standard coils. Smoother pay-off, less scrap loss, easier shipping."

possible with this process and any curvature down to a radius of 3 in. The process may be used for instrument and machine housings, containers and tanks. (Molded Fiber Glass Sheet Co.)

For more data circle No. 41 on postcard, p. 135

High-Temperature Alloy

For service in temperatures ranging up to and including 2300°F, an alloy has good foundry and weldability characteristics. Prime immediate applications are: heat-treat furnace parts for the steel and automotive industries, tubes for the chemical industry, cement kiln parts, smelting furnace and calcining furnace parts. (American Brake Shoe Co.)

For more data circle No. 42 on postcard, p. 135

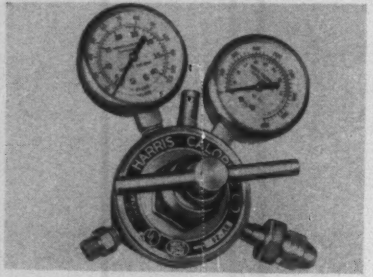
Industrial Repair Kit

Containing a new industrial, strong and tough repair material, a repair kit repairs castings, patterns, core boxes, molds, valves, pumps and all types of industrial machine tools. Small and large holes in castings can now be filled and redrilled to proper size. A large machine tool base that has been machined incorrectly can be built up and salvaged with the kit. (Devcon Corp.)

For more data circle No. 43 on postcard, p. 135

Gas Metering Regulator

Metering regulators for oxygen, carbon dioxide, helium, nitrogen and argon are very accurate. They mount in any position without affecting the accuracy of flow. There are no gaskets to loosen, causing loss of gas and erroneous reading of flow. The gage dial shows actual flow in cu ft per hour consumed. (Harris Calorific Co.)



For more data circle No. 44 on postcard, p. 135

Pressure Gage Snubber

With 13 different accurate settings, a pressure gage snubber has a snubbing action that prevents damage and excessive wear in sensitive gages. Accurate readings of the gage are obtained by the elimination of rapid fluctuations of the needle. Maximum working pressure is 5000 psi. The gage is made in high strength forgings of brass and stainless steel, in sizes ¼ in. and ½ in. internal pipe threads. (Republic Mfg. Co.)

For more data circle No. 45 on postcard, p. 135

Tool Chamfers, Deburrs

A chamfering and deburring tool incorporates all the advantages of single-lip construction into a tool that has a truly new lip form. This new grind, on which there is a

---

EXECUTIVE REPORT #12

A PIPE DREAM COMES TRUE

Wheelabrator® cleans skelp edges at new low cost

Another example of steel industry savings made possible by Wheelabrator mechanical descaling is the exceptional economy realized by pipe rolling mills in cleaning of skelp. Here it is desired to clean only a small strip along both edges of the bottom side of the skelp, which will be butted together and electro-welded.

In the Wheelabrator process, two blasting wheels are positioned to pinpoint their abrasive barrage along the edges, giving fast, thorough cleaning of these surfaces only.

Wheelabrator leads in mechanizing steel mill descaling methods

In over 100 installations in all types of steel mill applications, Wheelabrator has proven its cost-saving benefits. For engineering consultation call or write Wheelabrator Corporation, 510 S. Byrkit St., Mishawaka, Indiana. In Canada, P. O. Box 490, Scarborough, Ontario.

WHEELABRATOR

WHEELABRATOR
AIRLESS BLAST EQUIPMENT

JOB SPECIFICATIONS

Material: SAE 63 naval bronze casting

Thread Specifications:

Diameter	4.640"
Length	4¼"
Type	4 pitch modified square

Equipment: LANDIS 5ALT Tap with 4½" tap head on a No. 5 Gisholt turret lathe

COARSE THREADS *tapped at lower cost*

A LANDIS ALT Collapsible Tap produces coarse pitch threads in less than a minute in one pass on a rotating bronze coupling part at the Holys Mfg. Co., Forest Park, Ill.

This installation is an example of the "money-saving" potential of LANDIS Taps. Their ability to tap at one pass large diameter coarse pitch threads requiring heavy metal removal in brass or steel reduces threading time. In addition, LANDIS Precision Tap Chasers produce a maximum number of pieces between grinds to further reduce "per piece" cost.

Various sizes of ALT Taps are available for threading all diameters from 1¼" to 13¼". Write for Bulletin G-94 for further information.

524

LANDIS *Machine* COMPANY WAYNESBORO • PENNSYLVANIA

GOWN BY FON TAYNE; STAINLESS

from creative Crucible

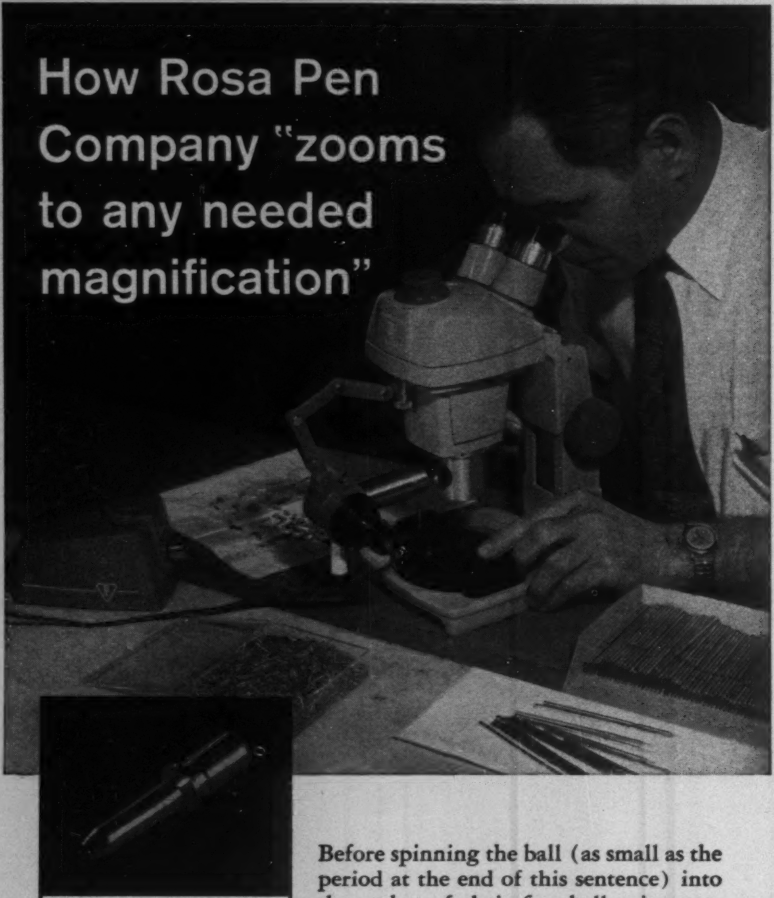
Where a fine finish is only the beginning

The lustrous beauty and unsurpassed finish of Crucible stainless steel will enhance the sales appeal of any product. Crucible's experienced metallurgists can help you select the most suitable type, form and finish, and the most efficient technique for fabricating. Add to this the convenience of Crucible's nearby steel service centers (35 throughout the country) and you'll find Crucible an unbeatable combination — for superior steel . . . service . . . and supply.

CRUCIBLE

Stainless Steel

SHEET, STRIP, ROD AND WIRE BY **CRUCIBLE STEEL COMPANY OF AMERICA** PITTSBURGH 30, PA.



How Rosa Pen Company "zooms to any needed magnification"

Rosa uses B&L StereoZoom Microscopes for internal inspection of socket this size...., zooms instantly to any power needed for other inspections.

Before spinning the ball (as small as the period at the end of this sentence) into the socket of their fine ball-point pen, Rosa Pen Company, Lyndhurst, N. J., uses B&L StereoZoom® Microscopes for a number of critical checks.

They check the interior finish of the socket (1 mm to .025" diameter, depending on the model), using the B&L Vertical Illuminator for depth lighting. The ink channels inside the socket are checked for uniformity and freedom from flaw. The ball is checked for finish, uniform surface, feather edge. After assembly, ball and socket are inspected for concentricity and free spin, and the ball's feather edge is checked again.

"With this new B&L microscope," says Mr. A. G. Rosa, President, "we can zoom up or down, for the different magnifications we need for different inspections—from 3.5X to 120X—with the work always in the field of view, and the same free working distance all the time."

Find out how B&L StereoZoom Microscopes can help solve some of *your* toughest assembly and inspection problems.

BAUSCH & LOMB INCORPORATED
85209 Bausch St., Rochester 2, N. Y.

☐ Send me new B&L StereoZoom Catalog D-15

☐ Schedule a demonstration at my convenience.

Name, Title ....

Company ....

Address ....

City .... Zone .... State ....

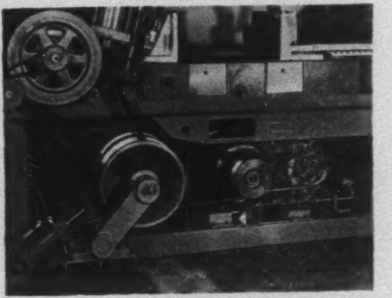
BAUSCH & LOMB
SINCE 1853

patent pending, enables industry for the first time to obtain a tool that will curl the chip up and away from the work. This completely eliminates forcing any metal into the edge of the opening or causing a ridge to be formed around the opening. Easy to regrind, the sharpening requires a minimum of equipment and time. It is made of vanadium alloys, quality controlled M-2 high-speed steel, hardened to exacting specifications and then treated to a special process that eliminates much of the galling common to all cutting tools. (Jancy Engineering Co.)

For more data circle No. 46 on postcard, p. 135

Drive System

The variable-speed drive of the manufacturer's power saws, provides a band speed range from 50-350 fpm. Even with its 5-hp capacity, the expected belt life is in excess of 2000 hours. (The DoALL Co.)

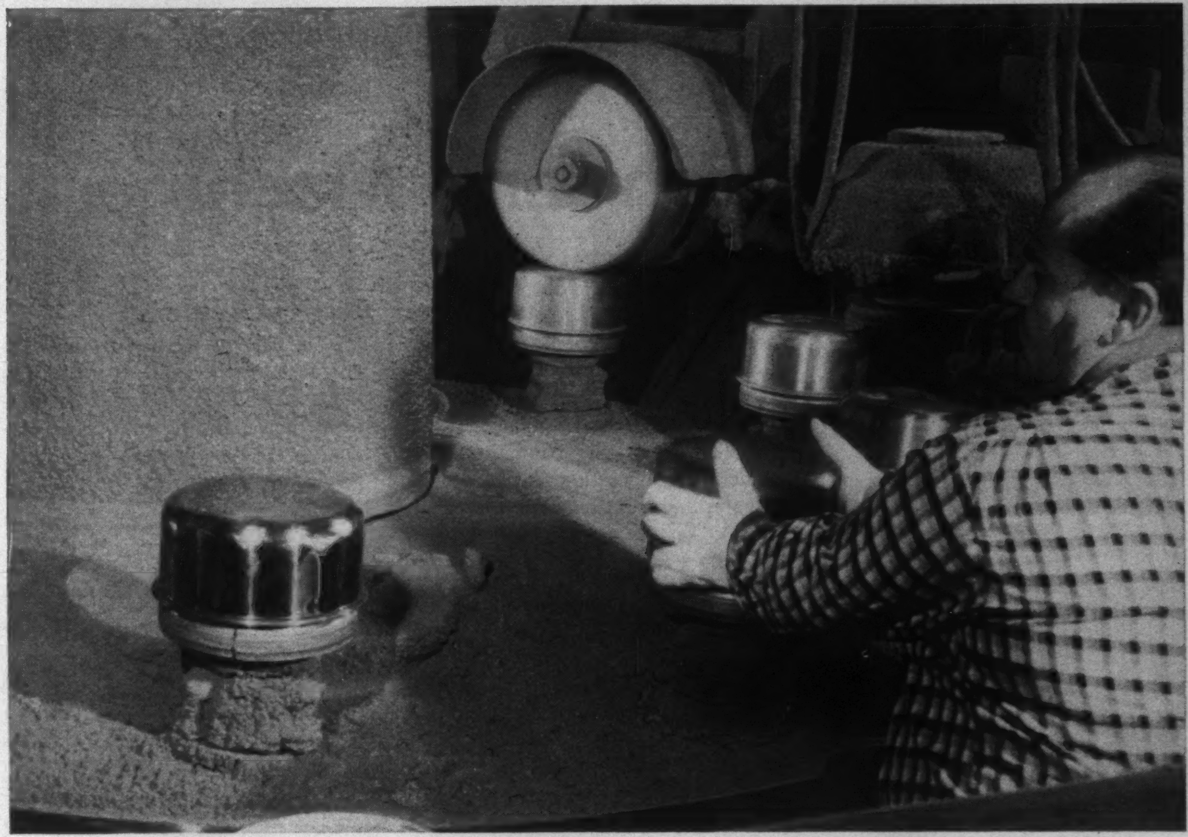


For more data circle No. 47 on postcard, p. 135

Water Brake

For absorption of the shaft horsepower of engines, turbines and other rotating machinery, a water brake, when used with suitable power measurement equipment, becomes an economical and versatile method of measuring power output. The water brakes come in seven basic models with maximum power absorption of from 1000 hp at 20,000 rpm to 8000 hp at 10,000 rpm. In addition, each model can be adjusted to provide its own range of power absorption. (Kahn & Co.)

For more data circle No. 48 on postcard, p. 135



3M Abrasives Cut Costs of Steel Utensil Finishing

Nationally famous, "Ekcoware" cooking utensils are manufactured here in the housewares division of Ekco Products, Inc., Massillon, Ohio. Prior to color buffing, these copper-clad stainless steel pans are given a final polishing.

Abrasives Ekco formerly used for this final finishing required a considerable amount of "break-in" time and caused many pan rejects.

Now, thanks to a 3M Representative's suggestion, Ekco has switched to 3M "PG" Wheels. The results have been remarkable. "PG" wheels have upped production 20%, eliminated one handling operation, reduced rejects, and produced a better finish on the pans. There's no "break-in" period either, as 3M "PG" Wheels maintain an even cut from installation to throw-away point.

Why not let 3M's new Cost Check 5-4-5 Program help you to effectively investigate ways to lower costs and increase production. Discover:

- If your grinding can be done more economically
- If your finishing is as efficient as possible
- If your polishing can be done faster and better

Send today for a free Cost Check 5-4-5 Review Form without obligation. Put 3M's years of abrasive know-how at your disposal.

3M Coated Abrasives

SEND IN TODAY

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Send me my free Cost Check 5-4-5 Kit.

COST CHECK 5-4-5

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MINNESOTA MINING AND MANUFACTURING COMPANY
. . . WHERE RESEARCH IS THE KEY TO TOMORROW

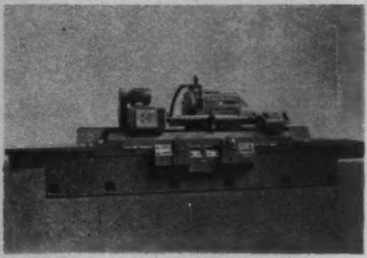
"3M" AND "PG" ARE REGISTERED TRADEMARKS OF 3M CO., ST. PAUL 6, MINN. EXPORT: 99 PARK AVE., NEW YORK 16. CANADA: LONDON, ONTARIO

New Equipment and Machinery

Turret Lathe Has Memory Control System

Fully automated, a 25-in. turret lathe has a "memory" control system. With this system, the operator machines the first workpieces in the usual way. As he completes each machining operation, he records it by pushing a button. From this point on, and as many more workpieces as are desired, the lathe is guided by these recorded "commands" to perform automatically the same sequence of machining operations. (Warner & Swasey Co.)

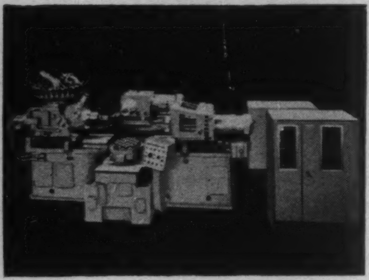
For more data circle No. 49 on postcard, p. 135



Tape-Controlled Grinder Features Wheel Balancer

An important breakthrough reduces the cost of precision multiple-diameter grinding. This breakthrough centers on a tape-controlled cylindrical-grinding machine. This machine replaces time-consuming manual operations with programmed cycling. Capacity between centers is 18 x 72 in. Servo controls provide highly responsive, precise movements of the wheelhead and the table. A 2-hp motor drives the headstock. A 20-hp motor powers the grinding wheel. (The Cincinnati Milling Machine Co.)

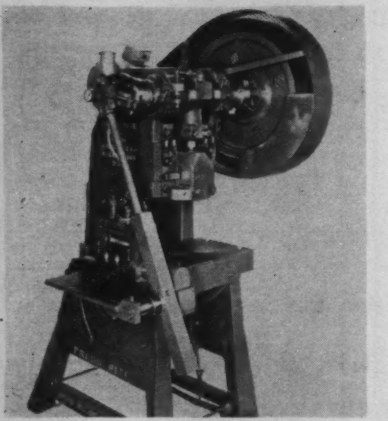
For more data circle No. 50 on postcard, p. 135



Machine Tool Automates Job Lot Production

Tape controlled, a machine tool brings production-line efficiency to batch lot production of parts requiring face and other milling cuts. This also includes drilling, boring, reaming and tapping operations. The unit will perform machining work on a large variety of parts in sizes up to that containable within a 12-in. cube. The three-station machine has independent spindle drive motors, each with 5-to-7½-hp capacity. Designed on the building block principle, it has a central positioning table. (Hughes Aircraft Co.)

For more data circle No. 51 on postcard, p. 135



Power Press Features Automatic Feed

A power press has a built-in, non-repeat single-stroke attachment which increases efficiency. Front and rear ramway lubrication gives full lubrication whether press is upright or inclined. The press offers automatic feed. The feed is a rack-and-pinion roll feed unit equipped with an overrunning clutch. It provides an unusually long feed advance of up to 5.8 in. An air-operated clamping device gives positive control of material going into the press. Air pressure is adjustable according to type of material being run. A reversing key and finger permits reversing the press without removing the cam when setting up dies. Automatic brake eliminates excessive heating and wear. Standard equipment on all models (5-85 tons) includes: automatic cam-actuated brake; non-repeat single-stroke safety mechanism; knockout bar on slide; bronzed bushed main bearings; anti-friction roller bearings in flywheel; extra-heavy ram. (Havir Mfg. Co.)

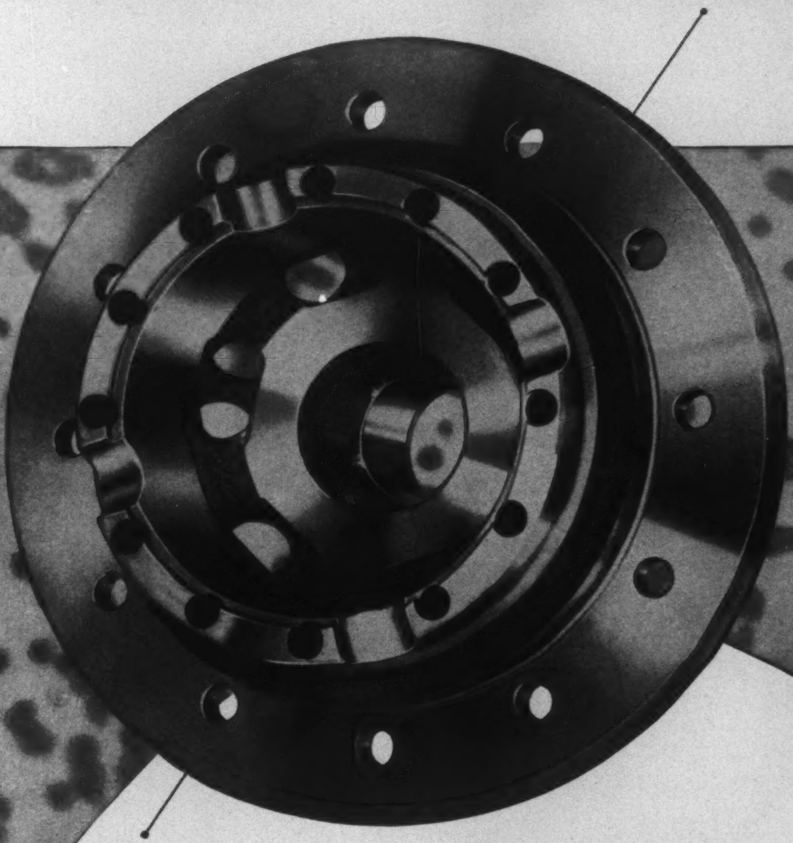
For more data circle No. 52 on postcard, p. 135

is your problem

machinability?

NATIONAL HTM CASTINGS

are the answer



Important Physical Properties	
Brinell	163 to 302*
Yield, psi	48,000 to 85,000*
Ultimate, psi	70,000 to 110,000*
Elongation, %	7 to 2*

**Depending upon grade*

There are many reasons for specifying HTM (Pearlitic Malleable) castings for your product. One is *machinability of 70-90 percent* (B1112 steel = 100).

But there are many other equally valid reasons. High ultimate strength . . . extreme wear resistance under heavy loads and high speeds . . . non-seizing qualities . . . air or liquid quenching . . . ability to be smooth-finished.

So when you're looking over the materials field, don't overlook the advantages of HTM castings. For HTM metal can be cast by either the shell mold, CO_2, or green sand methods. This means production costs tumble . . . performance and saleability of your product go up.

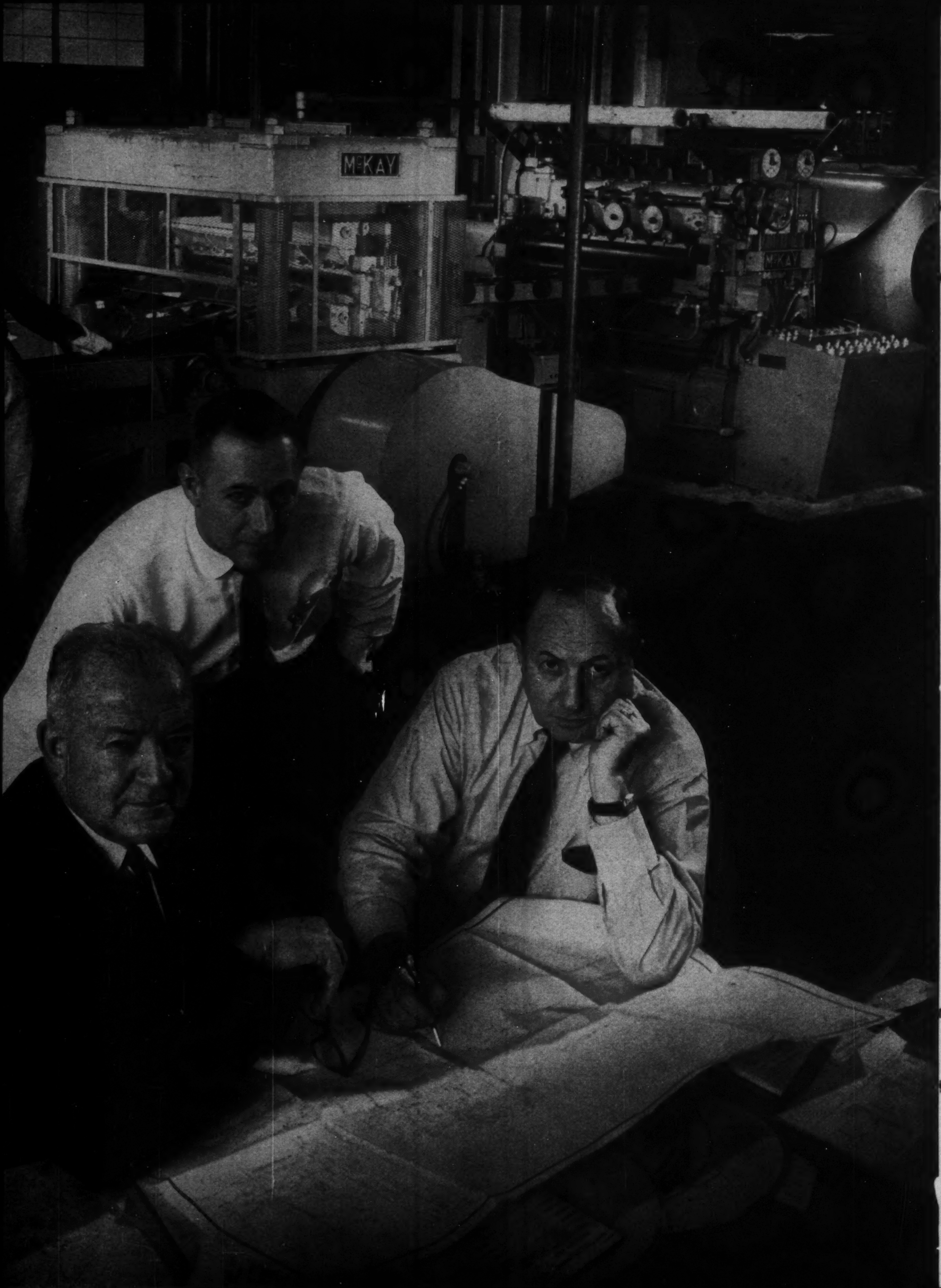
member
MALLEABLE
CASTINGS COUNCIL

NATIONAL MALLEABLE and STEEL **CASTINGS COMPANY**

Established 1868

Cleveland 6, Ohio

The nation's largest independent producer of malleable and pearlitic malleable


McKAY
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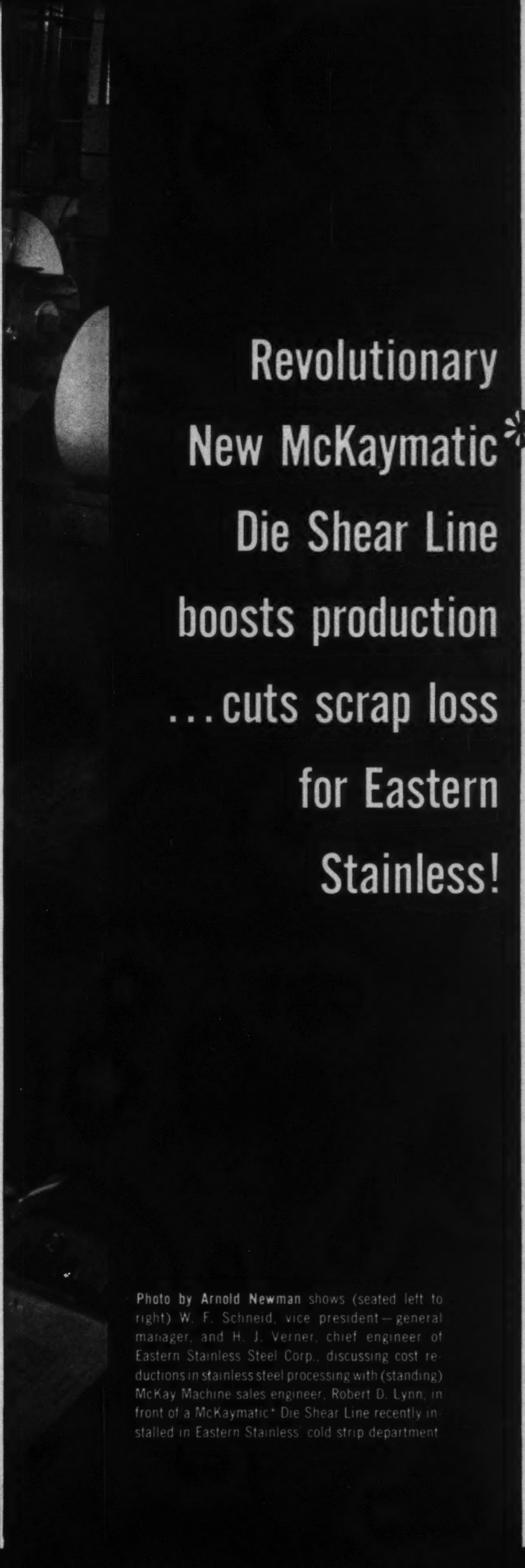

Revolutionary New McKaymatic* Die Shear Line boosts production ...cuts scrap loss for Eastern Stainless!

Photo by **Arnold Newman** shows (seated left to right) W. F. Schneid, vice president—general manager, and H. J. Verner, chief engineer of Eastern Stainless Steel Corp., discussing cost reductions in stainless steel processing with (standing) McKay Machine sales engineer, Robert D. Lynn, in front of a McKaymatic* Die Shear Line recently installed in Eastern Stainless' cold strip department.

"We consider the McKaymatic* the finest advancement in shearing to come along in a great many years," says W.F. Schneid, vice president-general manager, of Eastern Stainless Steel Corporation, Baltimore, Md. "We have reduced production time, cut our scrap loss, and have recorded an overall increase in department efficiency as a direct result of this new McKay die shear line," Mr. Schneid continues.

Eastern Stainless is a prime supplier of stainless steel sheets, strip and plates, for aircraft and missile parts, for food, chemical, paper and textile machinery and for architectural uses. It produces 25 grades of stainless steel in its own modern electric furnace facilities, and ships about sixty-six percent of it in sheet form.

Programs many grades instantly—Through improved roller leveler techniques, Eastern Stainless found it was able to instantly program many grades of sheet through its new McKaymatic* Die Shear Line. The line decoils, levels in a 17-roll McKay Roller Leveler, measures by electronics and cuts to length—replacing a cut-up, re-level, and re-square operation prior to boxing. Production of cut lengths has been substantially increased.

The result, they report, is cost savings. Says Mr Schneid: "As a result of our efforts to improve customer service, we installed this line to speed up production of these cut lengths. It has enabled us to break a production bottleneck for which there seemed to be no solution."

Line eliminates stretcher leveling—Mr. Schneid continued that production time has been reduced on sheets of five grades as a result of being able to eliminate stretcher leveling and re-squaring procedures. Also, he said, the scrap loss on re-squaring has been eliminated as the sheets are cut clean and square on the McKay line. Net effect of the installation was a definite increase in overall departmental efficiency.

H. J. Verner, chief engineer, remarked that the McKay roller leveler could process these grades of stainless, within its capacity, to flatness approaching that obtained from the stretcher method. He reported that the Die Shear Line is being used to prepare for shipping cold rolled sheet from 4″ to 48″ in width, up to .050″ in thickness, and in lengths from 36″ and greater at normal production speeds. He particularly likes the McKaymatic* Die Shear Line for its ability to handle high finish stainless without edge or surface damage.

Available in many sizes—The McKaymatic* Die Shear Line is available in sizes to accommodate most commercial widths. Composed of decoiler (with coil car, if desired), roller leveler, measuring device, and cutoff press, it satisfies most requirements for sheet length accuracy and squareness, flatness, edge and surface quality protection and output rate.

For short runs or long, the McKaymatic* Die Shear Line will better any other line in economy and efficiency. Whatever your cut-to-length problem, McKay Machine's engineers have a solution. Write for literature; send your specific needs for a quotation to *McKay Machine Company, Youngstown 1, Ohio.*

*TM

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FOR PROGRESS IN METAL PROCESSING

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SIMONDS has over 60 years' experience in cutting quality industrial gears. We can supply any type of gear in cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite in a full range of sizes adaptable to the material. Also heat-treated, case or flame hardened gears of carbon or alloy steel. Send us your requirements for quotation.

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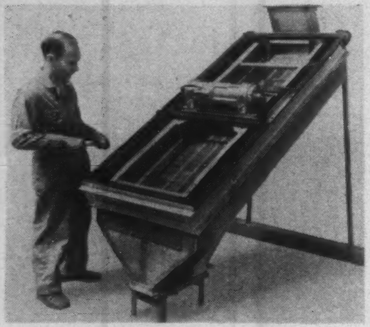
Screening Unit

Self-contained, a screening unit readily adapts to an infinite variety of uses. Some of its features are: all-welded construction of the frame, custom high-frequency vibrating motor (1/3 hp, 60 cycle, 3600 rpm). To insure accuracy and efficiency, each unit is engineered to meet individual requirements. (Derrick Mfg. Co.)



For more data circle No. 53 on postcard, p. 135

Power Controller

Electro-thermally-actuated, a stepless power input controller can be used to control flask heaters, mantles, heating tapes, water baths, small furnaces and other equipment. This compact instrument is truly stepless. The user can set any percentage of time on, from 5 to 100 pct. A neon pilot light turns on and off as the power is cycled. This unit automatically compensates for wide variations in voltage and ambient temperature. The corrosion-resistant stainless steel case incorporates a fuse to protect connected equipment and a female receptacle that accepts either a two- or three- prong plug. The circuit is rated at 115 v ac, 1500 w. (Thermo Electric Co.)

For more data circle No. 54 on postcard, p. 135

Indicator Crayons

Temperature - indicating crayons and paints can be used in any industrial or commercial application where temperature, and its correct determination, are factors. These easy-to-use temperature - measuring devices accurately indicate the temperature of any hot surface by distinct changes in color. The changes are not slight alterations in the shade of the original color, but an easily discernible change to a different color. (Air Reduction Sales Co.)

For more data circle No. 55 on postcard, p. 135

Force Gages

Precision mechanical force gages measure tension in a permanent test set-up. The force indicator's free-floating transmission rod, which transmits the tension load to a dial indicator, is threaded at its end for mounting in test apparatus or fixtures. The force gages are available in capacities of 20, 50, 75, 100, 150, 200, and 500 lb. The force-gage series is ruggedly constructed and housed in a cold-rolled steel case with a black wrinkle finish. Internal construction features a fully-compensated spring mechanism and a precise dial indicator. (Hunter Spring Co., a Div. of American Machine & Metals, Inc.)

For more data circle No. 56 on postcard, p. 135

Recorder Spots Trouble

A graphic recording instrument helps spot hidden trouble in ma-

Dalmine S.p.A.

Leading Italian producer of steel tubes and tubular products, have informed their Customers that the Holding Finsider, to which they belong, have recently reorganized their commercial Services.

In this circumstance, the export business concerning all the products manufactured by the Companies of the Finsider Group has been entrusted to only one Company.

As a matter of consequence, all tubular products manufactured by the Dalmine S.p.A. will be henceforth sold abroad through the new organization:

SIDEREXPORT S.p.A.

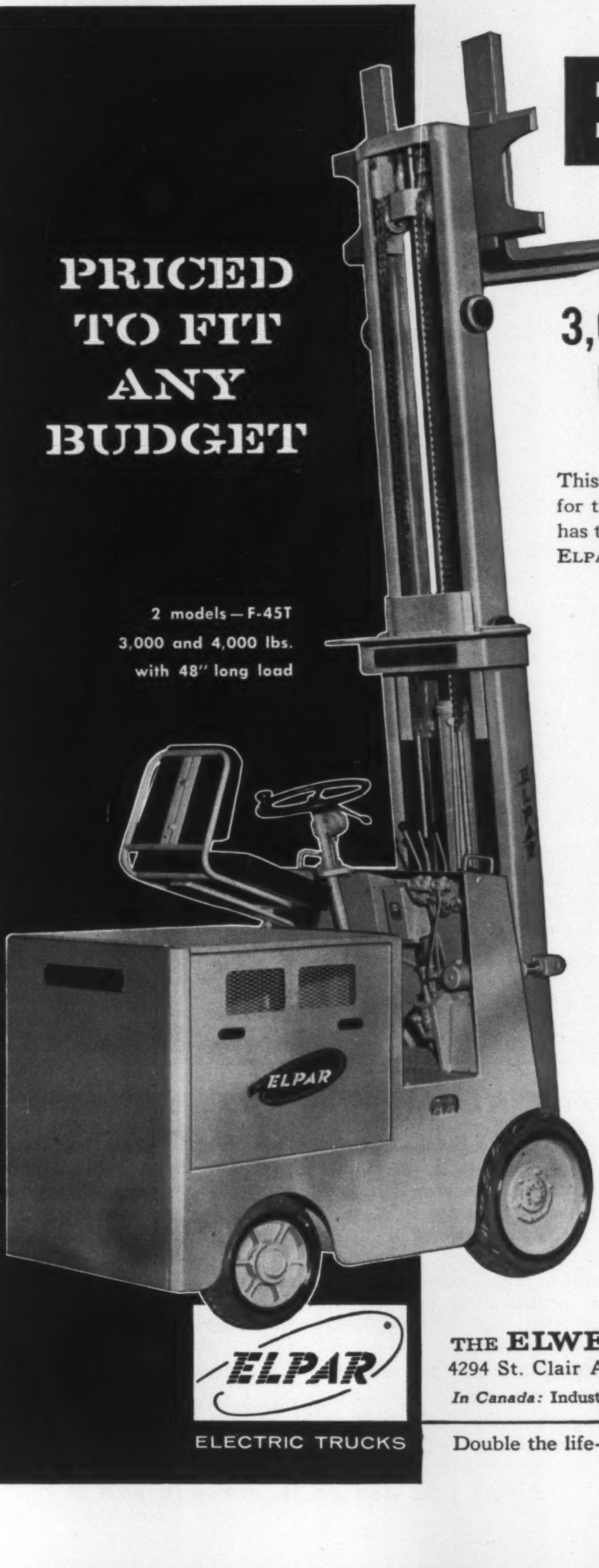
with Management and Head Office of the Tube Division in Milan
Via Brera, 21, Tel. 8858, Cable address: SIDEREXPORT—Milan

ELPAR

"F-45T"

3,000 & 4,000 lb. Cap. Electric Fork Truck

PRICED TO FIT ANY BUDGET



2 models — F-45T
3,000 and 4,000 lbs.
with 48" long load

This ELPAR fork truck is the new pace setter for the industry. It's priced competitively yet has the traditional quality that is typical of all ELPAR electric trucks. Check these advantages:

FAST—Travel speeds up to 7 MPH and lift speeds to 40 FPM.

COMPACT—Only 35" wide with an 84½" stacking aisle (less forks).

DEPENDABLE—Heavy duty construction, oversize tires, low pressure hydraulics, rugged drive axle, center-sill frame.

SAFE—Wide stance trail axle—26¾" tread, hydraulic wheel brakes, inching control, improved operator vision.

ECONOMICAL—Operates on pennies per day electric power and is designed for fast, easy maintenance.

This truck has been job tested in service on all kinds of jobs and has proved its economy and dependability.

Available for Fast Delivery

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But perhaps your interest in aluminum is confined to barn roofs, auto trim, engine castings, high-purity aluminas or architectural extrusions—what then? Alcoa has over 1,300 publications on these and kindred subjects, with another 325 to 350 new publications due this year. To supply your needs, in any quantity, Jim carries more than 55,000,000 copies in his warehouse—and is geared to answer your request within 24 hours.

The world's greatest fund of aluminum knowledge is another added value we provide with every pound of Alcoa® Aluminum you buy. Aluminum Company of America, 2018-J Alcoa Building, Pittsburgh 19, Pa.

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All of Alcoa's skills are mobilized to a single purpose: To put more than just 16 ounces of metal in every pound of Alcoa Aluminum you buy. Here are 12 of the dozens of ways to do it:

1. **Research Leadership,** bringing you the very latest in aluminum alloys and applications.
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5. **Quality Control** to meet top standards or match your special needs.
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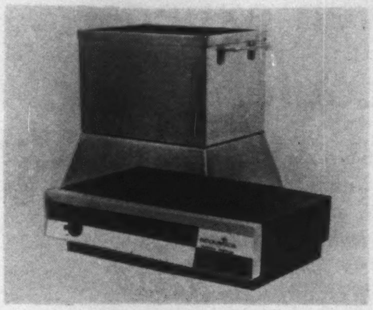
chine operations and processes. It accomplishes this by timing short duration events to millisecond accuracy, even at slow chart speeds. The recorder monitors automated operations, and provides split-second timing along with "time-of-day" information. This accurate timing aids in detecting equipment malfunction or other difficulties often missed by stop-watch time studies. Standard chart speeds of ¾, 1½, 3, 6 and 12 in. per hour and per minute are provided. The recorder operates on 115 v, 60 cycles. (R. B. Annis Co.)

For more data circle No. 57 on postcard, p. 135

Ultrasonic Cleaning

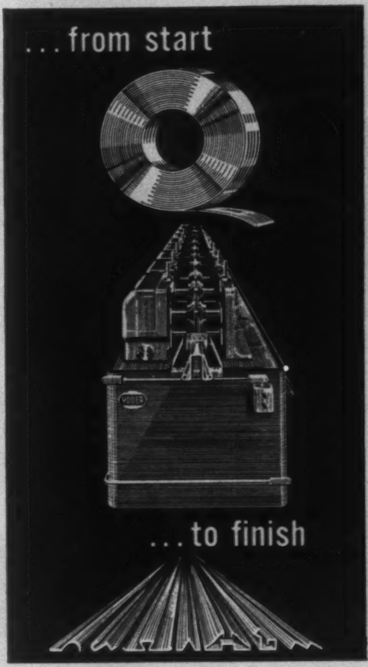
Fully-transistorized electronic generators activate a line of ultrasonic cleaning systems. They provide new simplicity of operation through automatic tuning. The units insure maximum cleaning power at a constant rate. The miniaturized 20-kc equipment utilizes a newly-devised semiconductor circuit in a completely different operating principle to eliminate all tuning adjustments and meter readings. This way, peak performance is obtained from each transducer used in a cleaning tank. (Acoustica Assoc., Inc.)



For more data circle No. 58 on postcard, p. 135

Indicator

An electric indicator signals "out of tolerance." In this new gage, an electric signal is generated whenever established tolerance limits are exceeded. This signal can be used to turn on lights or for automatic con-



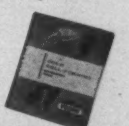
YODER ROLL-FORMING EQUIPMENT

Profits are available to you through the production of many shapes in metal . . . made with precision and economy on Yoder Cold Roll Forming Equipment.

Produce tubular, ornamental or structural shapes from a variety of metals in widths from a fraction of an inch up to 80 inches or more, and in stock up to ¾" thick. Your investment is comparatively modest, and with proven low operating costs, will give you one of the most profitable operations in your plant.

Experienced Yoder engineers will, without obligation, study your annual metal forming requirements. Many times they can point out that the installation of roll forming equipment would—even if operated only intermittently—soon justify its initial cost.

Send today for this comprehensive, 88-page illustrated text. It fully describes Cold Roll Forming Equipment, processes and products.



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5510 Walworth Avenue • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING
COLD ROLL FORMING MACHINES

Jomac gloves stand up under treatment that even expensive leather gloves couldn't take!

The test shown above, in which a razor blade is drawn sharply across a Jomac glove without ill effect, shows the remarkable cut resistance of Jomac's loop-pile fabric . . . *protection that even leather doesn't afford.*

Moreover, Jomac gloves *wear longer* than leather gloves and provide a *better grip* on oily surfaces. And most Jomacs—like the HR gloves shown above—are reversible . . . so any two make a pair, any pair gives you four working surfaces.

Write today for free literature. Describe working conditions and materials handled: we'll make specific recommendations.

Jomac also makes a complete line of North PVC-coated gloves

JOMAC
INDUSTRIAL GLOVES

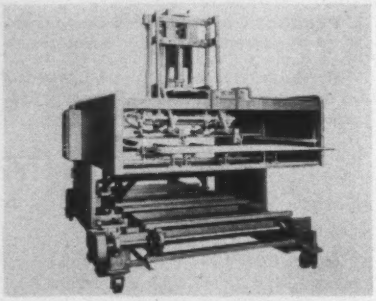
JOMAC INC., DEPT. K, PHILADELPHIA 38, PA.

trol. By the addition of an adapter, the light box can be converted to a summarizing box for up to six electric indicators when gaging multiple dimensions. With this arrangement, an out of tolerance condition will be signaled by the "over" and/or "under" light. If all dimensions are within tolerance, the "good" light will signal. (Hamilton Watch Co.)

For more data circle No. 59 on postcard, p. 135

Destacks and Feeds

An automatic vacuum cup destacker lifts one sheet at a time from the top of a stack of blank sheets. It indexes forward and deposits the sheet on the feed station. The lifter mechanism then returns and picks up another sheet. As this sheet is indexed forward to the feed station, pushers, attached to the lifter mechanism, push the previously loaded sheet from the feed station thru a double sheet detecting safety device into a punch press, shear, roller leveller, roller applicator, or other machine. (Die and Automation Inc.)



For more data circle No. 60 on postcard, p. 135

Travelling Drill

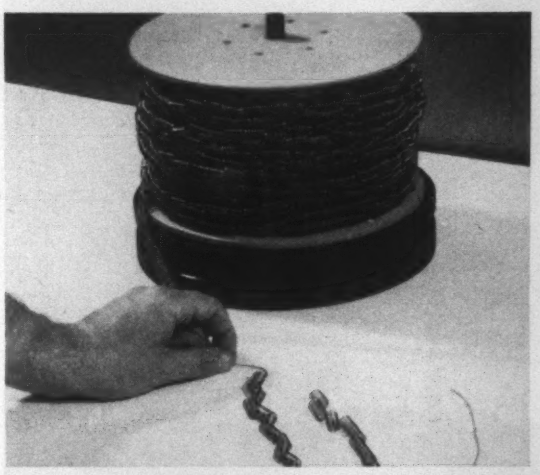
Numerically-controlled, an open-side travelling drill can put a 3-in. diam hole through steel plate at the rate of 5½ ipm. The work table, which has a positioning accuracy of 0.001 in., can handle stock 6-ft wide x 15-ft long. (The American Tool Works Co.)

For more data circle No. 61 on postcard, p. 135

Grinder

Completely electrically-controlled, a high-production grinder removes

Reduce your assembled costs with new Spring-Flow® packaging



Spring Flow
Associated Spring Corporation

...more efficient handling, storing, sorting, orienting, feeding, placing of springs for installation

A. S. C. SPRING FLOW

To production planners, Spring-Flow packaging opens up a world of possibilities for assembling A.S.C.-made springs, small stampings, and wire forms into your products easier and faster. It solves many problems caused by intricate shapes, tangling, loss by spoilage; maintains critical tolerances, uniform quality; simplifies inventory control and storage.

To learn how Spring-Flow may solve your problem, contact the nearest A.S.C. Division, or write for Spring-Flow booklet giving additional information.

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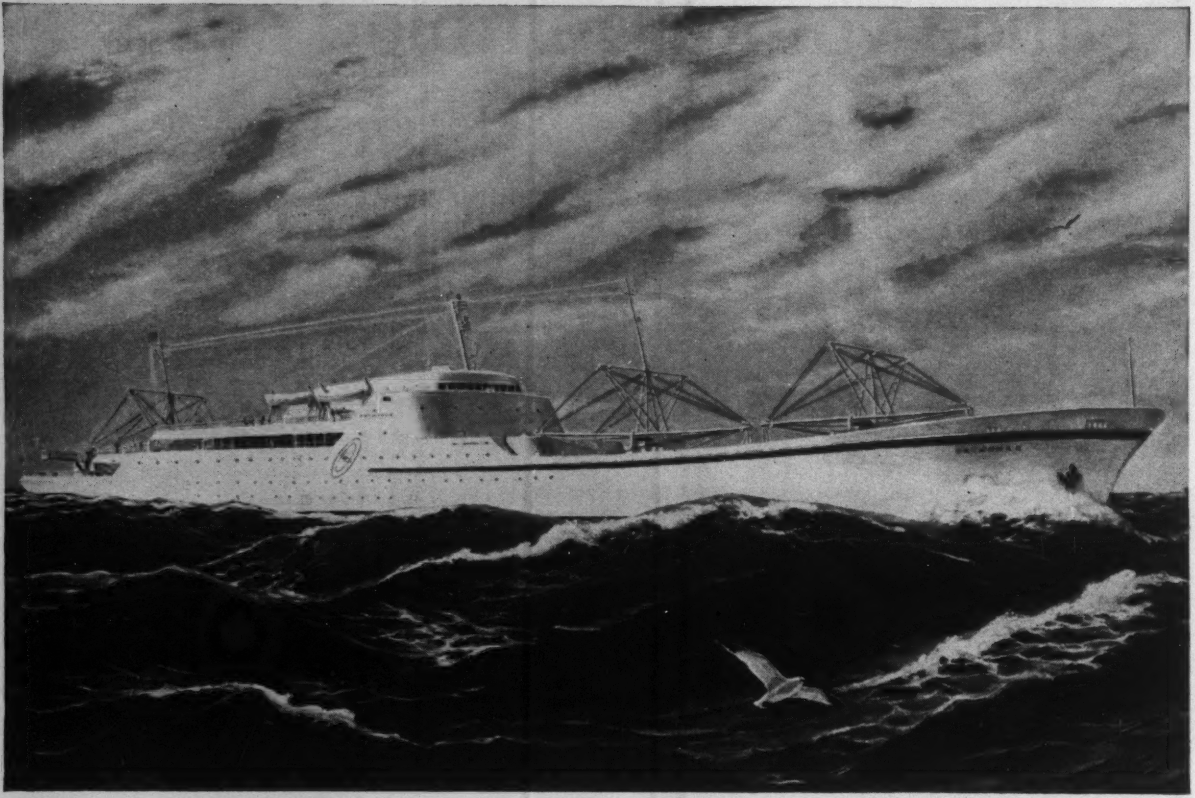
Raymond Manufacturing Division, Corry, Penna.
Ohio Division, Dayton, Ohio
Cleveland Sales Office, Cleveland, Ohio
Chicago Sales Office, Chicago, Ill.

B-G-R Division, Plymouth and Ann Arbor, Mich.
Gibson Division, Mattoon, Ill.
Milwaukee Division, Milwaukee, Wis.
Seaboard Pacific Division, Gardena, Calif.

Canadian Subsidiary: Wallace Barnes Co., Ltd., Hamilton, Ont. and Montreal, Que. Puerto Rican Subsidiary: Associated Spring of Puerto Rico, Inc., Carolina, P.R.



N.S. Savannah, built by New York Shipbuilding Corporation, can sail for three years on 138 pounds of nuclear fuel. A conventional ship would burn 80,000 tons of oil.

'round the world 13 times with fuel to spare ...the first nuclear-powered merchant ship

This is the Nuclear Ship Savannah, first of her kind. Capable of sailing over 350,000 nautical miles without re-fueling, she points the way to a new era in transport and travel at sea.

Her uranium oxide fuel is packaged in tubes of Nickel Stainless Steel*...more than 5,000 of them.* The fuel-element cans that hold these tubes are also made of this strong, corrosion-resisting metal.

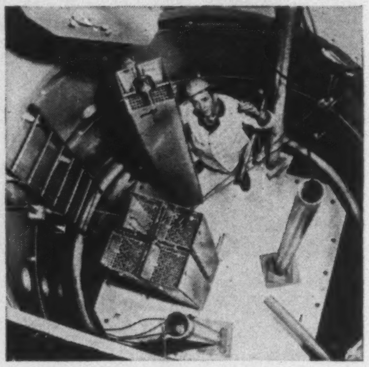
Wherever you look, inside the reactor, almost everything is Nickel Stainless Steel. 200,000 pounds of it are used in the reactor area: for the lining of the reactor vessel, for the coolant pumps and tubing that circulate corrosive "hungry" water, and for the control rods inside the atomic pile.

At the design stage, engineers anticipated the high operating pressures—1,750 pounds per square inch—and temperatures up to 508°F. They selected Nickel Stainless Steels to provide the strength and resistance to heat and corrosion needed to withstand these rigorous conditions.

So the next time you need more from a metal, remember the N.S. Savannah. Nickel Stainless Steel, or another Nickel alloy, may be the solution to *your* problem, too.

A note to Inco will bring you "First Steps Towards Solving Specific Corrosion Problems" and "High Temperature Worksheet"... simplified forms you can use to describe your metal problem. Perhaps our technical staff has information that will help you find the solution.

The International Nickel Company, Inc.
67 Wall Street New York 5, N.Y.



Inside the reactor nearly everything you see is Nickel Stainless Steel to withstand corrosion, high temperatures and pressures that hit 1,750 psi. Reactor built by Babcock & Wilcox Co., Barberton, Ohio.

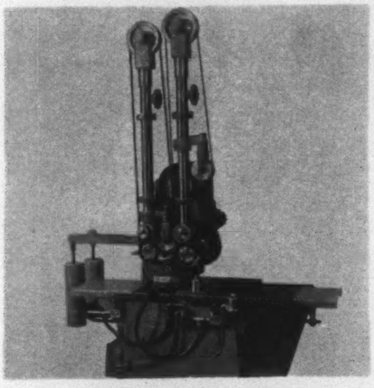
INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER up to 15 cu in. of metal per minute. It can finish grind to an accuracy of 0.0001 in. The machine has a 6-ft x 36-in. wide work surface and a 48-in. vertical capacity. (The Thompson Grinder Co.)

For more data circle No. 62 on postcard, p. 135

Abrasive Belt Grinder

A rise and fall abrasive belt grinder rough grinds and finish grinds contour and form parts in one cycle in seconds, automatically. The machine comes with single- or double-spindle assemblies. The latter gives the greatest versatility and speed. Other variations can be quickly adapted for handling special contours. (Eastern Machine Screw Corp.)



For more data circle No. 63 on postcard, p. 135

Gear-Blank Finisher

Tracer - controlled, a gear - blank finisher performs in 1½ minutes a lathe turning operation which previously required 45 minutes. The machine handles both front and back finishing — two operations — in a fully automatic cycle. (The National Acme Co.)

For more data circle No. 64 on postcard, p. 135

Test Thin Sheet Metal

Designed for foil and thin-sheet work, a ductility testing machine permits quick, accurate readings for both experimental and production work. Gripping pressure and movement of test piston of the machine may be adjusted to different levels independently of each other. The new testing machine comes in five gage calibrations. They range from 200-2000 lb, for work ranging from 0.002- to 0.020-in. maximum thickness. (Detroit Testing Machine Co.)

For more data crcle No. 65 on postcard, p. 135

Molding Machine

Thoroughly field tested, a 24/32-ounce injection molding machine offers a long adjustable stroke. The stroke is from 30-8 in., with a total daylight of 60 in. The dry cycle of the machine is 7.25 seconds on an 8-in. stroke; 8 seconds on a 20-in. stroke; and 9 seconds on a 30-in. stroke. The mold clearance between the beams is 25-in. horizontal x 27-in. vertical. (Lester-Phoenix, Inc.)

For more data circle No. 66 on postcard, p. 135

Thermobalance

Completely automatic, a recording thermobalance performs ther-

"GREAT SCOTT, PETE, SEVEN PILOT MODELS IN THE LAST THREE MONTHS AND STILL YOU'RE CHANGING IT? THE TOOLING COSTS, DUMBKOPF, THE TOOLING COSTS!"
"YOUR ALARM IS UNWARRANTED, POINDEXTER, ARWOOD INVESTMENT CASTS ALL OUR DESIGN PROTOTYPES..."

Machine the simple . . . cast the complex

A complete service from design through tooling, production and finish machining. Seventy-one engineering representatives from coast to coast.

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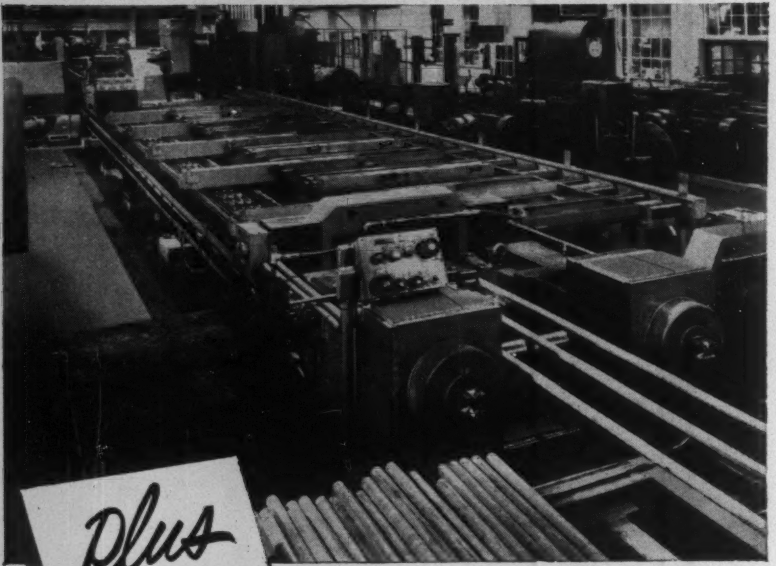
MODERN FACILITIES-



Plus

CONSTANT QUALITY AND METALLURGICAL CONTROL in every step of processing

. . . assure positive uniformity from bar to bar—order to order

Four modern, well-equipped mills at Ambridge, Pa.; Chicago, Ill.; Newark, N.J.; and Putnam, Conn., insure prompt deliveries and service for all of your cold drawn steel requirements.

For the finest in Cold Finished Steels always . . . specify WYCKOFF!

OUR CONSTANT RESEARCH PROGRAM IS YOUR BEST GUARANTEE OF QUALITY CONTROL

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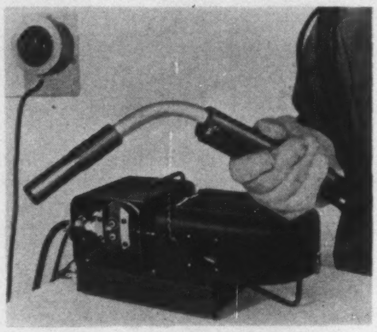
WYCKOFF STEEL PRODUCTS • Carbon, Alloy and Leaded Steels • Turned and Polished Shafting • Turned and Ground Shafting • Large Squares • Wide Flats up to 12¾" x 2¼" and 14" x 1¼" • All types of Furnace Treated Steels including Carbon Corrected Steels

mogravimetric studies in vacuum or controlled atmospheres at temperatures to 1000°C. The unit measures and automatically records changes in weight as a function of temperature programmed for a selected linear heating rate, or as a function of time at a constant temperature. (American Instrument Co., Inc.)

For more data circle No. 67 on postcard, p. 135

Welding Gun

For use with the gas-shielded metal-arc welding process, an air-cooled, push-type welding gun and wire feeder have particular value on applications requiring ruggedness, high-duty cycle, and an absolute minimum of down time. The gun has a 60-degree goose-neck nozzle assembly for welding in hard-to-reach places. It can be used with Buried arcwelding and Sprayarc welding using carbon dioxide (CO_2) as a shielding gas. It also can be used with standard gas-shielded metal-arc welding using argon as a shielding gas. The wire feeder, designed for use with this new welding gun, includes a remote speed control with 15 ft of service cord to provide wire feed speed adjustment, up to 600 ipm, near the work. (Air Reduction Sales Co.)

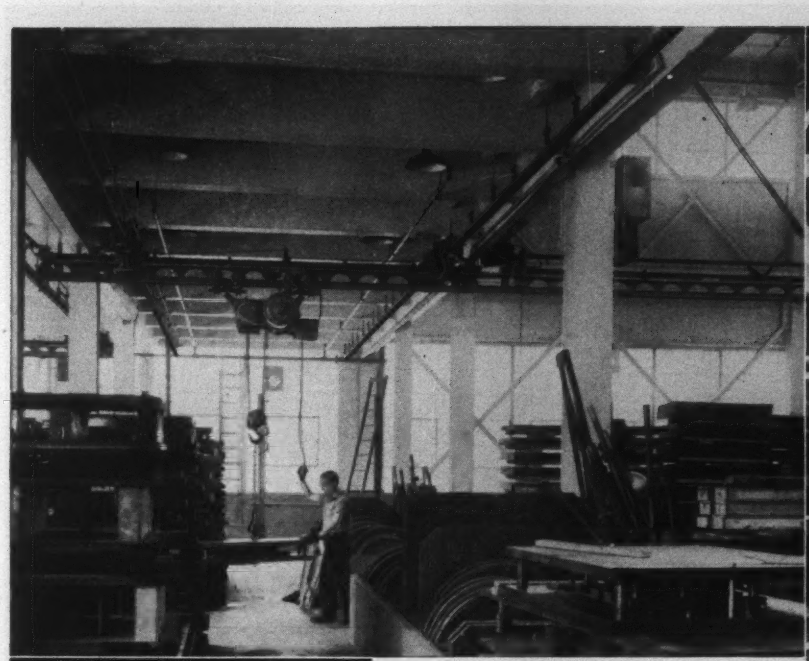


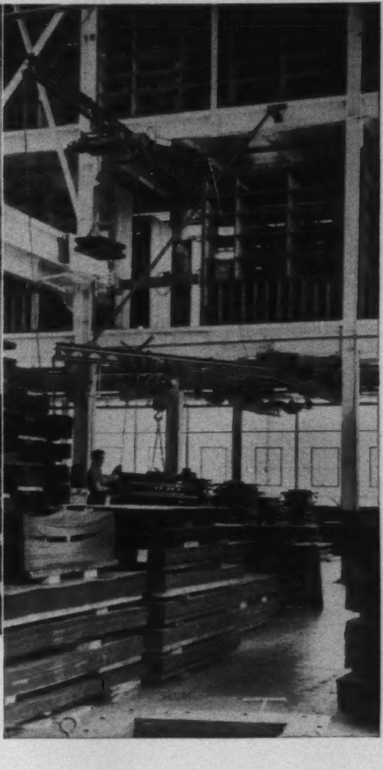
For more data circle No. 68 on postcard, p. 135

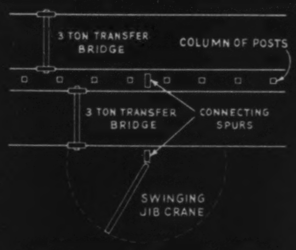
Pocket Comparator

A pocket comparator, with full 6-power magnification and etched glass reticle, makes it possible to do on-the-spot checking of linear dimensions, radii and angles. It will also check small holes in parts and castings. (Edmund Scientific Co.)

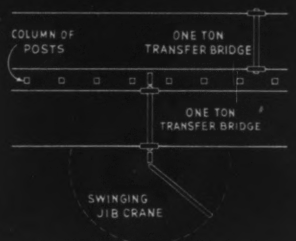
For more data circle No. 69 on postcard, p. 135






3 TON TRANSFER BRIDGE
COLUMN OF POSTS
3 TON TRANSFER BRIDGE
CONNECTING SPURS
SWINGING JIB CRANE

FIRST FLOOR TRAMRAIL LAYOUT


COLUMN OF POSTS
ONE TON TRANSFER BRIDGE
ONE TON TRANSFER BRIDGE
SWINGING JIB CRANE

SECOND FLOOR TRAMRAIL LAYOUT

...Unique Tramrail Layout

...Solves Handling Problem

The problem of handling heavy dies in the plant of a large electric motor manufacturer was solved by a combination of standard Cleveland Tramrail transfer bridges and swinging jib cranes.

The dies are stored on the first floor at one end of the building and also on a mezzanine directly above. Two crane runways with interlocking transfer bridges and a jib crane are provided for the first floor and similar handling equipment for the mezzanine. The equipment for the first floor is of 3-tons capacity because the heaviest dies are stored there. Lighter dies are stored on the mezzanine and only one-ton equipment is required here.

The Cleveland Tramrail equipment makes it an easy job to deliver dies to and from any point on the first floor or the mezzaine. Since the areas covered by the swinging jib cranes overlap, loads may be easily transferred from first floor to mezzanine or vice versa.

The bridges and carriers are hand propelled since the effort required to propel them even when fully loaded is very little. The heavy lifting is done by push-button-operated electric hoists.

Cleveland Tramrail representatives are in a position to help you solve today's problems or develop plans for the future.

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The Iron Age Summary

Some Improvement on the Way

It will scarcely be enough to push the ingot rate up, but a slight improvement is coming.

Inventories are down, at least for most users. But Chrysler cutbacks cause concern.

▪ A slight improvement in orders and a growing conviction that inventory liquidation is finally cleaned up combine to give the steel market a better tone this week.

But there is little visible relief and any improvement in the steel operating rate will be gradual and probably less than seasonal.

Fourth Quarter Outlook — The average operating rate for the fourth quarter now looks no better than from 57 to 59 (per cent of capacity). It may reach 65 at the high point, then return to the 50's.

This will bring the total steel tonnage for the year to less than 105 million tons, a far cry from the 127 to 130 million tons freely predicted last January and well below the all-time record of 117 million tons set in 1955.

Inventory Theories — Within the industry, there are conflicting theories on inventory levels. Market analysts argue that nearly 5 million tons of steel have been taken out of inventory in June, July, and August, with liquidation continuing through September.

This means that users will go into October with no more steel than they had at the start of the year and that the post-strike buildup has been entirely liquidated. To support this, one major producer reports that from 25 to 30 pct of its orders are shipped in the same month the order is placed.

Big Users Well-Stocked—On the other hand, some of the major users have adequate inventories and no upsurge in buying can be expected from them. These include automakers, who are buying with normal 45-day lead time and appliance makers who are loaded with steel and, to make matters worse, inventories of finished products.

The cutback in Chrysler output hit the automotive steel market hard, although in varying degrees according to supplier status. In effect, Chrysler is setting back three-fifths of October tonnage into November and cancelling another fifth. This makes October deliveries to the company only one-fifth of steel originally planned.

Auto Production—As yet, there is no indication that Ford or General Motors have the same problem. They started new model output later and apparently intend to hold to October schedules.

It is a sure thing, however, that the initial schedule of 685,000 cars in October will not be reached. With Chrysler's withdrawal of perhaps 33,000 cars, the total now looks closer to 650,000 cars, but this can change at any time.

Appliance makers tend to be long on their stocks. One Midwest appliance maker had a 60-day inventory. But an overnight cut of one-third in its production schedules automatically made it a 90-day inventory.

Another gloomy prospect: No big improvement in tubular goods is likely for two more years.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,545	1,547	1,483	362
Ingot Index				
(1947-1949=100)	96.2	96.3	92.3	22.5
Operating Rates				
North East Coast	62.0	62.0*	54.0	12.0†
Buffalo	57.0	59.0*	56.0	0.0†
Pittsburgh	46.0	42.0	44.0	30.0†
Youngstown	44.0	47.0*	41.0	10.0†
Cleveland	60.0	55.0	53.0	0.0†
Detroit	72.0	71.0*	72.0	26.0†
Chicago	58.0	61.0*	58.0	5.0†
Cincinnati	56.0	57.0*	56.0	72.0†
St. Louis	75.0	77.0*	63.0	97.0†
South	49.0	47.0*	59.0	12.0†
West	51.0	55.0*	48.0	0.0†
U. S. Rate	54.2	54.3	52.0	12.8

*Revised †IRON AGE Estimates

Source: American Iron and Steel Institute

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$31.50	$31.83	$32.50	$43.17
No. 2 bundles	$21.17	$22.17	$22.83	$29.17
Nonferrous				
Aluminum ingot	26.00	26.00	26.00	26.80
Copper, electrolytic	33.00	33.00	33.00	30-31.50
Lead, St. Louis	11.80	11.80	11.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	102.25	102.00	102.25	102.50
Zinc, E. St. Louis	13.00	13.00	13.00	12.00

Gear Prices to Hold Steady

Gearmakers see no upcoming price increases although they are faced with a 6 pct wage hike.

Reports indicate production has fallen off 10 pct from 1959 levels.

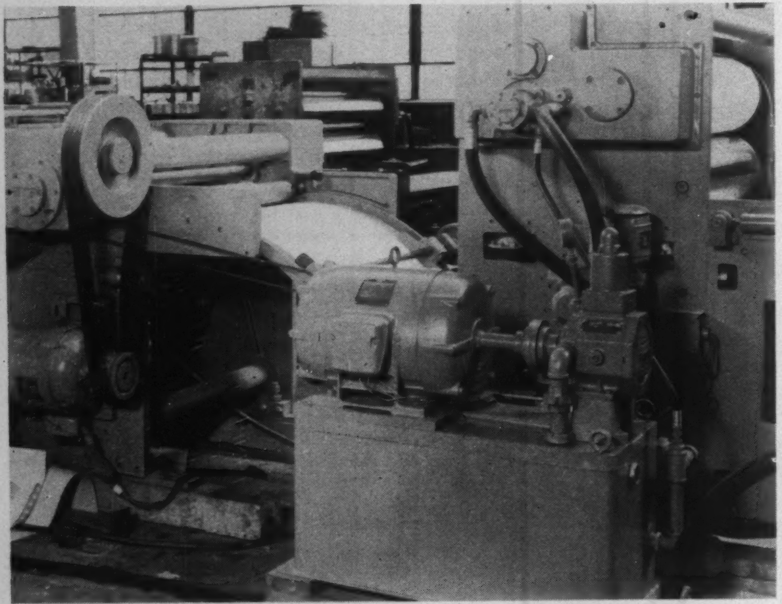
▪ Mechanical drives continue to show only minor gains over the summer period. Estimates of gear manufacturers suggest a decline of 10 pct below year ago levels; and some companies say their current levels of operation are well below the 10 pct figure.

Effect is to keep gear deliveries rapid and on-the-shelf inventories at a high level. The possibilities of a price increase seem pretty remote at present. This is despite the fact that, beginning this month, some manufacturers will be faced with a 6 pct gain in wage costs.

Foreign Pressure — Providing a ceiling for U. S. equipment prices is the fact that foreign equipment is being offered at 20 pct to as much as 40 pct under U. S. prices. Competition has been toughest on the West Coast, but it's been felt as far inland as Chicago. The foreign material is generally offered as a complete reducer - system, or power chain.

Chain, despite the price advances of the August-early-September period, is moving at a substantially greater rate of gain than are gears. The Japanese are offering competitive material at prices 25 pct below domestic U. S. price levels but can't compete with U. S. delivery times that range from off-the-shelf to an absolute maximum of 6 weeks.

No Bargain—Even with the current round of price advances in chain still going into effect, there has been some reported domestic price cutting, with reductions of 5 to 10 pct reported widely. These can't be pinned down specifically, and the chain buyer who goes bargain hunting will probably gain no price advantages without taking longer delivery or a reduction in the quality of the delivered chain.



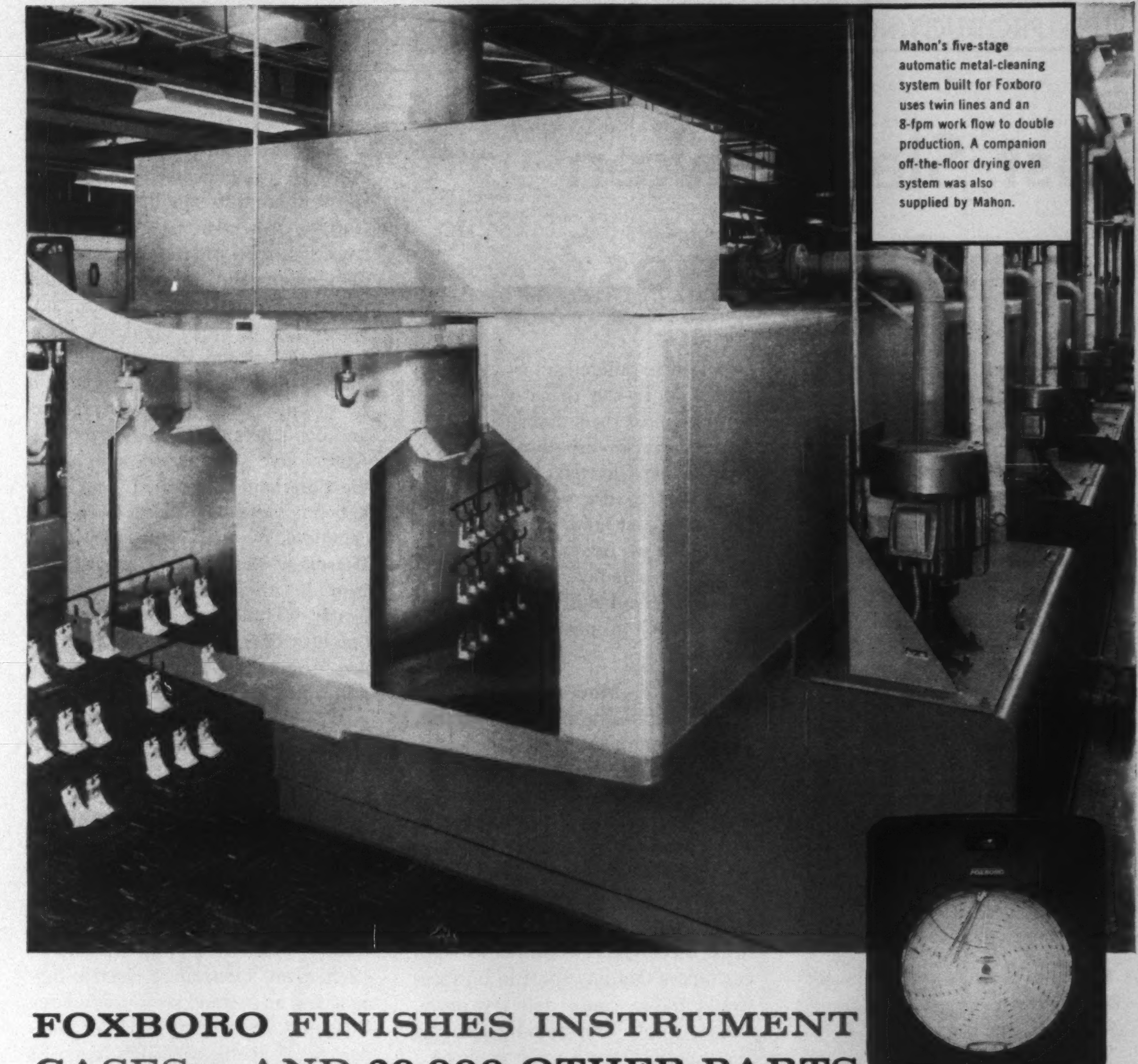
POWER DRIVE: Hydraulic fluid motor built by Racine Hydraulics & Machinery, Inc., is used to drive large rollers of a printing press.

Fall Off—On the hydraulics side, power transmission is showing no greater market gains. It appears that sales of hydraulic couplings and torque converters advanced in the latter part of August, and show at least mild gains during September, but are showing somewhat less than normal seasonal gains for the fall period.

Power transmission men, in a field that is traditionally a tough area to forecast, are understandably slow to suggest that they see an easily detectable pattern for the months to come. But the consensus, based on sales thus far in second half, is that there will be no really great gains made during fourth quarter 1960 and the first quarter of 1961 won't be a great deal better.

No Gains Predicted—No one sees a slide, but it is a fairly widespread feeling, and this includes producers of belting as well as gear and hydraulic drive equipment, that the latter part of 1960 will not see really strong advances beyond present business levels. It is expected that delivery of all materials will continue to be rapid, and that there will be few price advances in the latter part of 1960.

On the bright side of the hydraulics picture—export demand for this equipment is rising. Recent purchases include fairly sizeable orders from customers in Belgium, Germany, and France.



Mahon's five-stage automatic metal-cleaning system built for Foxboro uses twin lines and an 8-fpm work flow to double production. A companion off-the-floor drying oven system was also supplied by Mahon.

FOXBORO FINISHES INSTRUMENT CASES...AND 20,000 OTHER PARTS AS WELL...WITH MAHON EQUIPMENT

The Foxboro Company of Foxboro, Mass. is meeting the stepped-up industrial need for control and measuring instruments. Two new Mahon Finishing Systems and other allied equipment were recently installed to help solve Foxboro's accelerated production problems for these high-quality, high-precision products. The result: an automatic metal-cleaning process, flexible enough to handle some 20,000 parts—efficient enough to double capacity; and a space-conserving off-the-floor drying-oven system that integrates all priming and finish painting. The Mahon-engineered and built equipment not only met new production requirements under improved working conditions but also offered color flexibility (six of more than 150 colors can be run at one time).

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MAHON

Last Slack Taken From Deliveries?

Virtually all orders are getting rush treatment from mills as delivery promises shorten.

There's little room left to trim them further and no increase in demand is expected to cause them to stretch out.

▪ By rights, delivery promises from mills should be stretching out. If nothing else, a normal, seasonal increase in buying should be forcing mills to move out their promises. It isn't, and they aren't.

Most products in most districts reached minimum delivery times a few months ago. But the latest survey finds mills speeding deliveries by a week or better in many products. There's little room left for further reductions.

Midwest Decline — While flat-rolled products continue to support the market, the seriousness of the situation is pointed up by a further reduction in the delivery promises for hot-rolled sheet and strip. Maximum promises are three weeks in Detroit and Chicago. The minimum has fallen to one week in Detroit.

East Coast and Pittsburgh districts note no increase in the length of time it will take mills to deliver an order. And mills in these areas easily match promises with the Midwest mills.

Hand - to - Mouth — Apparently, many steel users are still whittling down inventories. And this is further aggravated by the fact that many of them are experiencing a drop in business. Consequently, their days-supply-of-material automatically increases with each drop.

Others rely on fast delivery to feed hand-to-mouth inventory practices. Steelmakers continue to warn customers that any spurt in business would likely cause delivery promises to move out rapidly, leaving many users scrambling. But steelmakers are little help in telling where and when such a spurt in business will occur.

Delivery Promises at a Glance

	East	Pittsburgh	Cleveland	Detroit	Chicago	West Coast
CR Carbon Sheet	2–5 wks	2–4 wks	3–5 wks	3–5 wks	2–4 wks	4–5 wks
HR Carbon Sheet	2–4 wks	2–4 wks	2–4 wks	1–3 wks	2–3 wks	4 wks
CR Carbon Strip	2–5 wks	3–5 wks	3–5 wks	3–5 wks	2–4 wks	4–5 wks
HR Carbon Strip	2–4 wks	2–4 wks	2–4 wks	1–3 wks	2–3 wks	4 wks
HR Carbon Bars	2–4 wks	1–3 wks	2–4 wks	1–4 wks	Stock–2 wks	3–4 wks
CF Carbon Bars	2–4 wks	1–3 wks	2–3 wks	Stock–8 wks	Stock–4 wks	1–2 wks
Heavy Plate	2–3 wks	1–2 wks			1–2 wks	4 wks
Light Plate	2–3 wks	1–2 wks	2–4 wks		1–2 wks	4 wks
Merchant Wire	Stock	Stock	1–3 wks		Stock	2 wks
Oil Country Goods	Stock	Stock	Stock		Stock	
Linepipe	Stock	1–4 wks	Stock		4–8 wks	4 wks
Buttweld Pipe	Stock	Stock	Stock	Stock–2 wks	Stock–2 wks	Stock
Std. Structurals	2–4 wks	1–2 wks	2–4 wks	1–4 wks	1–3 wks	2–4 wks
CR Stainless Sheet	Stock–4 wks	Stock–3 wks	Stock–4 wks	1–4 wks		
CR Stainless Strip	Stock–4 wks	Stock–3 wks	Stock–4 wks	1–4 wks		

Sheet and Strip — Sheet orders continue to gain strength, but reports all seem to contain a qualification or two. An **East Coast** mill says October orders are up over September. But, it points out, buying is strictly for use and the upward gain is very slight. A **Pittsburgh** mill claims there is a definite order improvement, but qualifies it by noting it is below expectations and can't be called a major pickup. Automotive sheet is still supporting the **Cleveland** cold-rolled sheet market, but there have been large cancellations as well. The story from **Detroit** is the same. Chrysler will trim fourth quarter schedules by nearly 90,000 units, will take only one-fifth of the steel in October that was originally ordered. A **Chicago** mill optimistically reports a definite order pickup, but won't bet on October being a better month than September.

Bars—A new bar and rod mill is under construction at Vinton, Texas, near El Paso. Slated for completion in October, 1961, it will have a capacity of 50,000 tons per year. Initial installation will include a 12 ft diam. Lectromelt electric furnace and an 8-stand semi-continuous Bliss mill. It is being built for Border Steel Rolling Mills, Inc., El Paso. Automotive customers in the **Midwest** are holding orders for bars to a minimum. They are relying on fast mill delivery.

Wire — Late season activity in welded wire fabric for road building is helping **Cleveland** mills, but the general wire situation is gloomy. Automotive customers are cutting back purchases from **Chicago** mills. And wire salesmen believe fastener producers are rapidly building up inventories of finished goods. This could lead to sharp cutbacks later. Many users carry virtually no inventory, relying on fast delivery from mills to keep production lines operating.

COMPARISON OF PRICES

(Effective Sept. 27, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Sept. 27 1960	Sept. 20 1960	Aug. 30 1960	Sept. 29 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Sept. 27 1960	Sept. 20 1960	Aug. 30 1960	Sept. 29 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, South Cin'ti.	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$31.50	$31.50	$31.50	$45.50
No. 1 steel, Phila. area	34.50	34.50	34.50	43.50
No. 1 steel, Chicago	28.50*	29.50	31.50	40.50
No. 1 bundles, Detroit	27.50*	28.50	29.50	39.50
Low phos., Youngstown	33.50*	34.50	35.50	45.50
No. 1 mach'y cast, Pittsburgh	47.50	47.50	47.50	53.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	52.50
No. 1 mach'y cast, Chicago	43.50*	45.50	47.00	62.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$31.50*	$31.83	$32.50	$43.17
No. 2 bundles	21.17*	22.17	22.83	29.17
Coke, Connelsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.50-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00	33.00	30-31.50
Copper, Lake, Conn.	33.00	33.00	33.00	31.50
Tin, Straits, N. Y.	102.25†	102.00	102.25	102.50
Zinc, East St. Louis	13.00	13.00	13.00	12.00
Lead, St. Louis	11.80	11.80	11.80	12.80
Aluminum, ingot	26.00	26.00	26.00	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

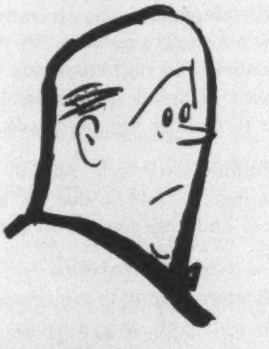
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.



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* Appears in the Sept. 22-Oct. 6 issues.

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Market Tones Are Even Weaker

Scrap prices are down again this week. Now there are reports of weakening exports.

The IRON AGE composite for No. 1 heavy melting dropped for the first time in three weeks.

▪ An even weaker tone prevails on the scrap market this week. And there are signs that the bottom has not yet been reached. Many areas also report a weak note in export activity.

In Pittsburgh, the feeling of weakness is growing. Scrap prices dropped again in Chicago for the third straight week. Buffalo prices nosed downward and market weakness crept into Detroit and Cleveland.

Dealers in Philadelphia say a definite weakness is noted in export. This is also true to different degrees in New York, Houston, and Detroit. In some areas where prices appear to be holding firm, there is actually too little activity to warrant a drop. Also, key locations such as Pittsburgh, Detroit, Cleveland, Cincinnati, and Houston, report that the prospects are for an even weaker October.

The IRON AGE composite price on No. 1 heavy melting dropped for the first time in three weeks to $31.50. The composite for No. 2 bundles is down again to $21.17.

Pittsburgh—The feeling of weakness is growing. However, there is not enough new activity to establish lower prices. One mill has dropped its buying price for No. 2 bundles from $26 to $25. Nevertheless, dealers are still being paid $26 on an old order at another mill. No. 1 railroad heavy melting brought about the same as last month on a late list. On the same list, railroad specialties were down as much as $4. Auto lists for October show tonnage up sharply from September. For one large list the gain is about 30 pct.

Chicago—Scrap slipped again as mills purchased dealer grades at prices $1 to $2 off previous levels. Tonnages were small, but sufficient to weaken the entire market. Factory list bidding was weak. Sales of factory material in small lots, prior to the closing of the major lists, were off as much as $2. Major lists, however, are expected to show slightly greater price strength. The price of No. 1 dealer bundles was incorrectly quoted last week. Correct price: $30 to $31.

Philadelphia—The market is at an absolute standstill domestically. The price of No. 2 bundles and heavy breakable cast dropped this week, but other prices are unchanged. Most dealers report that export is beginning to show signs of weakness and the market is generally weaker.

New York—The market is still at the third quarter level. But there are factors that could turn the market down somewhat. Scrap generation has picked up slightly after the normal summer slump. But foreign buying shows signs of easing. Domestic business is still non-existent. Nevertheless, most dealers expect little, if any, change through the rest of the year.

Detroit — Indications are that prices are lower on October industrial lists. Just how much lower is the question. Whether exporters will buy or not is up in the air. Domestic mills appear light on demand, and Canadian interest shows no increase. Dealers are worrying about high scrap inventories and the potential taxes written on these inventories in December.

Cleveland—The market is down another $1 as a new glut of production scrap is due to come out of area plants next month and overhang the market. Area tonnage is 25,000 tons or better because of new model production. Only small shipments of dealer material are being sold and it has backed up in most yards.

Cincinnati—The market is off another $1 based on present broker buying levels and anticipation of a weak October market. Only a small demand from area mills is expected and out of town demand is also absent. Foundry business is slow.

St. Louis—A sluggish, dull scrap market still prevails. Prices are unchanged but the undertone is weak. Industrial lists this week are likely to put more pressure on the market.

Birmingham — Scrap movement continues fairly good in this district. Foundries, in particular, are steady buyers of small quantities, but no one is making big purchases.

Buffalo — Prices on all items dropped this week due to lack of sales, and the general market outlook.

Boston—Activity continues to be very dull with only a trickle of export. There is virtually no domestic business and the trade is pessimistic.

West Coast—Prices continue soft and some dealers expect a $1 to $2 drop soon. New Japanese orders are in. Some 210,000 tons of scrap are scheduled to leave West Coast ports during the next three months.

Houston — The market is quiet and some brokers are apprehensive about the outlook. A district mill has informed brokers it does not plan to buy any bundles through October.

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NKK

NIPPON KOKAN K.K.

(Japan Steel & Tube Corporation)

Head Office: Otemachi, Chiyoda-ku, Tokyo
Cables: STEELTUBE TOKYO, KOKANSHIP TOKYO
New York Office: Room No. 1115, 39 Broadway, New York 6, N.Y., U.S.A.
European Office: Kreuzstrasse 34 II, Düsseldorf, West Germany

SCRAP PRICES *(Effective Sept. 27, 1960)*

Pittsburgh

No. 1 hvy. melting	$31.00 to	$32.00
No. 2 hvy. melting	26.00 to	27.00
No. 1 dealer bundles	32.00 to	33.00
No. 1 factory bundles	38.00 to	39.00
No. 2 bundles	25.00 to	26.00
No. 1 busheling	31.00 to	32.00
Machine shop turn.	15.00 to	16.00
Shoveling turnings	20.00 to	21.00
Cast iron borings	19.00 to	20.00
Low phos. punch'gs plate	38.00 to	39.00
Heavy turnings	27.00 to	28.00
No. 1 RR hvy. melting	37.00 to	38.00
Scrap rails, random lgth.	45.00 to	46.00
Rails 2 ft. and under	49.00 to	50.00
RR specialties	43.00 to	44.00
No. 1 machinery cast.	47.00 to	48.00
Cupola cast.	37.00 to	38.00
Heavy breakable cast.	35.00 to	36.00
Stainless		
18-8 bundles and solids	185.00 to	190.00
18-8 turnings	95.00 to	100.00
430 bundles and solids	90.00 to	95.00
410 turnings	60.00 to	65.00

Chicago

No. 1 hvy. melting	$28.00 to	$29.00
No. 2 hvy. melting	26.00 to	27.00
No. 1 dealer bundles	29.00 to	30.00
No. 1 factory bundles	32.00 to	33.00
No. 2 bundles	17.00 to	18.00
No. 1 busheling	28.00 to	29.00
Machine shop turn.	12.00 to	13.00
Mixed bor. and turn.	14.00 to	15.00
Shoveling turnings	14.00 to	15.00
Cast iron borings	14.00 to	15.00
Low phos. forge crops	38.00 to	39.00
Low phos, punch'gs plate, ¼ in. and heavier	34.00 to	35.00
Low phos. 2 ft. and under	32.00 to	33.00
No. 1 RR hvy. melting	32.00 to	33.00
Scrap rails, random lgth.	39.00 to	40.00
Rerolling rails	50.00 to	51.00
Rails 2 ft. and under	44.00 to	45.00
Angles and splice bars	41.00 to	42.00
RR steel car axles	49.00 to	50.00
RR couplers and knuckles	38.00 to	39.00
No. 1 machinery cast.	43.00 to	44.00
Cupola cast.	38.00 to	39.00
Cast iron wheel	29.00 to	30.00
Malleable	42.00 to	43.00
Stove plate	32.00 to	33.00
Steel car wheels	37.00 to	38.00
Stainless		
18-8 bundles and solids	175.00 to	180.00
18-8 turnings	85.00 to	90.00
430 bundles and solids	85.00 to	90.00
430 turnings	40.00 to	50.00

Philadelphia Area

No. 1 hvy. melting	$34.00 to	$35.00
No. 2 hvy. melting	30.00 to	31.00
No. 1 dealer bundles	35.00 to	36.00
No. 2 bundles	20.00 to	21.00
No. 1 busheling	35.00 to	36.00
Machine shop turn.	14.00 to	15.00
Mixed bor. short turn.	14.00 to	15.00
Cast iron borings	14.00 to	15.00
Shoveling turnings	20.00 to	21.00
Clean cast. chem. borings	23.00 to	24.00
Low phos. 5 ft and under	37.00 to	38.00
Low phos. 2 ft punch'gs	39.00 to	40.00
Elec. furnace bundles	36.00 to	37.00
Heavy turnings	27.00 to	28.00
RR specialties	39.00 to	40.00
Rails, 18 in. and under	51.00 to	52.00
Cupola cast.	38.00 to	39.00
Heavy breakable cast.	37.00 to	38.00
Cast iron car wheels	40.00 to	41.00
Malleable	45.00 to	46.00
No. 1 machinery cast.	49.00 to	50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$25.50 to	$26.50
No. 2 hvy. melting	21.50 to	22.50
No. 1 dealer bundles	25.50 to	26.50
No. 2 bundles	16.50 to	17.50
Machine shop turn.	9.00 to	10.00
Shoveling turnings	12.00 to	13.00
Cast iron borings	12.00 to	13.00
Low phos. 18 in. and under	34.00 to	35.00
Rails, random length	40.00 to	41.00
Rails, 18 in. and under	48.00 to	49.00
No. 1 cupola Cast.	36.00 to	37.00
Hvy. breakable cast.	30.00 to	31.00
Drop broken cast.	47.00 to	48.00

Youngstown

No. 1 hvy. melting	$31.00 to	$32.00
No. 2 hvy. melting	24.00 to	25.00
No. 1 dealer bundles	31.00 to	32.00
No. 2 bundles	21.00 to	22.00
Machine shop turn.	15.00 to	16.00
Shoveling turnings	18.00 to	19.00
Low phos. plate	33.00 to	34.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	$29.00 to	$30.00
No. 2 hvy. melting	20.50 to	21.50
No. 1 dealer bundles	29.00 to	30.00
No. 1 factory bundles	31.50 to	32.50
No. 2 bundles	18.00 to	19.00
No. 1 busheling	29.00 to	30.00
Machine shop turn.	12.00 to	13.00
Mixed bor. and turn.	15.00 to	16.00
Shoveling turnings	15.00 to	16.00
Cast iron borings	15.00 to	16.00
Cut structural & plates, 2 ft. & under	34.00 to	35.00
Low phos. punch'gs plate	30.00 to	31.00
Drop forge flashings	29.00 to	30.00
Foundry steel, 2 ft. & under	32.00 to	33.00
No. 1 RR hvy. melting	33.50 to	34.50
Rails 2 ft. and under	48.00 to	49.00
Rails 18 in. and under	49.00 to	50.00
Steel axle turnings	23.00 to	24.00
Railroad cast.	46.00 to	47.00
No. 1 machinery cast.	49.00 to	50.00
Stove plate	38.00 to	39.00
Malleable	44.00 to	45.00
Stainless		
18-8 bundles	180.00 to	185.00
18-8 turnings	75.00 to	80.00
430 bundles	80.00 to	85.00

Buffalo

No. 1 hvy. melting	$27.00 to	$28.00
No. 2 hvy. melting	23.00 to	24.00
No. 1 busheling	27.00 to	28.00
No. 1 dealer bundles	27.00 to	28.00
No. 2 bundles	19.00 to	20.00
Machine shop turn.	11.00 to	12.00
Mixed bor. and turn.	12.00 to	13.00
Shoveling turnings	15.00 to	16.00
Cast iron borings	13.00 to	14.00
Low phos. plate	34.00 to	35.00
Structurals and plate, 2 ft. and under	36.00 to	37.00
Scrap rails, random lgth.	35.00 to	36.00
Rails 2 ft. and under	45.00 to	46.00
No. 1 machinery cast.	45.00 to	46.00
No. 1 cupola cast.	39.00 to	40.00

St. Louis

No. 1 hvy. melting	$29.00 to	$30.00
No. 2 hvy. melting	27.00 to	28.00
Foundry steel, 2 ft.	29.00 to	30.00
No. 1 dealer bundles	31.00 to	32.00
No. 2 bundles	20.00 to	21.00
Machine shop turn.	7.00 to	8.00
Shoveling turnings	9.00 to	10.00
Cast iron borings	20.00 to	21.00
No. 1 RR hvy. melting	31.00 to	32.00
Rails, random lengths	37.00 to	38.00
Rails, 18 in. and under	39.00 to	40.00
RR specialties	38.00 to	39.00
Cupola cast.	42.00 to	43.00
Heavy breakable cast.	34.00 to	35.00
Stove plate	36.00 to	37.00
Cast iron car wheels	34.00 to	35.00
Rerolling rails	51.00 to	52.00
Unstripped motor blocks	35.00 to	36.00

Birmingham

No. 1 hvy. melting	$29.00 to	$30.00
No. 2 hvy. melting	24.00 to	25.00
No. 1 dealer bundles	29.00 to	30.00
No. 2 bundles	19.00 to	20.00
No. 1 busheling	31.00 to	32.00
Machine shop turn.	17.00 to	18.00
Shoveling turnings	19.00 to	20.00
Cast iron borings	10.00 to	11.00
Electric furnace bundles	32.00 to	33.00
Elec. furnace, 3 ft. & under	35.00 to	36.00
Bar crops and plate	39.00 to	40.00
Structural and plate, 2 ft.	38.00 to	39.00
No. 1 RR hvy. melting	33.00 to	34.00
Scrap rail, random lgth.	39.00 to	40.00
Rails, 18 in. and under	44.00 to	45.00
Angles and splice bars	38.00 to	39.00
No. 1 cupola cast.	47.00 to	48.00
Stove plate	47.00 to	48.00
Cast iron car wheels	38.00 to	39.00
Unstripped motor blocks	34.00 to	35.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to	$30.00
No. 2 hvy. melting	21.00 to	22.00
No. 2 dealer bundles	16.00 to	17.00
Machine shop turnings	7.00 to	8.00
Mixed bor. and turn.	9.00 to	10.00
Shoveling turnings	10.00 to	11.00
Clean cast. chem. borings	18.00 to	19.00
No. 1 machinery cast.	37.00 to	38.00
Mixed yard cast.	33.00 to	34.00
Heavy breakable cast.	31.00 to	32.00
Stainless		
18-8 prepared solids	160.00 to	165.00
18-8 turnings	80.00 to	85.00
430 prepared solids	70.00 to	75.00
430 turnings	20.00 to	25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to	$25.00
No. 2 hvy. melting	17.00 to	18.00
No. 1 dealer bundles	27.00 to	28.00
No. 2 bundles	16.00 to	17.00
No. 1 busheling	24.00 to	25.00
Drop forge flashings	24.00 to	25.00
Machine shop turn.	9.00 to	10.00
Mixed bor. and turn.	12.00 to	13.00
Shoveling turnings	12.00 to	13.00
Cast iron borings	12.00 to	13.00
Heavy breakable cast.	30.00 to	31.00
Mixed cupola cast.	34.00 to	35.00
Automotive cast.	42.00 to	43.00
Stainless		
18-8 bundles and solids	165.00 to	170.00
18-8 turnings	55.00 to	60.00
430 bundles and solids	55.00 to	60.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$25.00 to	$26.00
No. 2 hvy. melting	20.00 to	21.00
No. 1 dealer bundles	25.00 to	26.00
No. 2 bundles	14.00 to	15.00
No. 1 busheling	25.00 to	26.00
Machine shop turn.	5.00 to	6.00
Shoveling turnings	8.00 to	9.00
Clean cast. chem. borings	12.00 to	13.00
No. 1 machinery cast.	38.00 to	39.00
Mixed cupola cast.	32.00 to	33.00
Heavy breakable cast.	27.50 to	28.50

San Francisco

No. 1 hvy. melting	....	$34.00
No. 2 hvy. melting	....	30.00
No. 1 dealer bundles	....	30.00
No. 2 bundles	....	20.00
Machine shop turn.	$14.00 to	15.00
Cast iron borings	14.00 to	15.00
No. 1 cupola cast.	....	46.00

Los Angeles

No. 1 hvy. melting	....	$32.00
No. 2 hvy. melting	....	29.00
No. 1 dealer bundles	....	27.00
No. 2 bundles	....	17.00
Machine shop turn.	....	13.00
Shoveling turnings	....	15.00
Cast iron borings	$15.00 to	16.00
Elec. furnace 1 ft. and under (foundry)	42.00 to	43.00
No. 1 cupola cast.	....	44.00

Seattle

No. 1 hvy. melting	....	$35.00
No. 2 hvy. melting	....	33.00
No. 2 bundles	....	22.00
No. 1 cupola cast.	....	36.00
Mixed yard cast.	....	36.00

Hamilton, Ont.

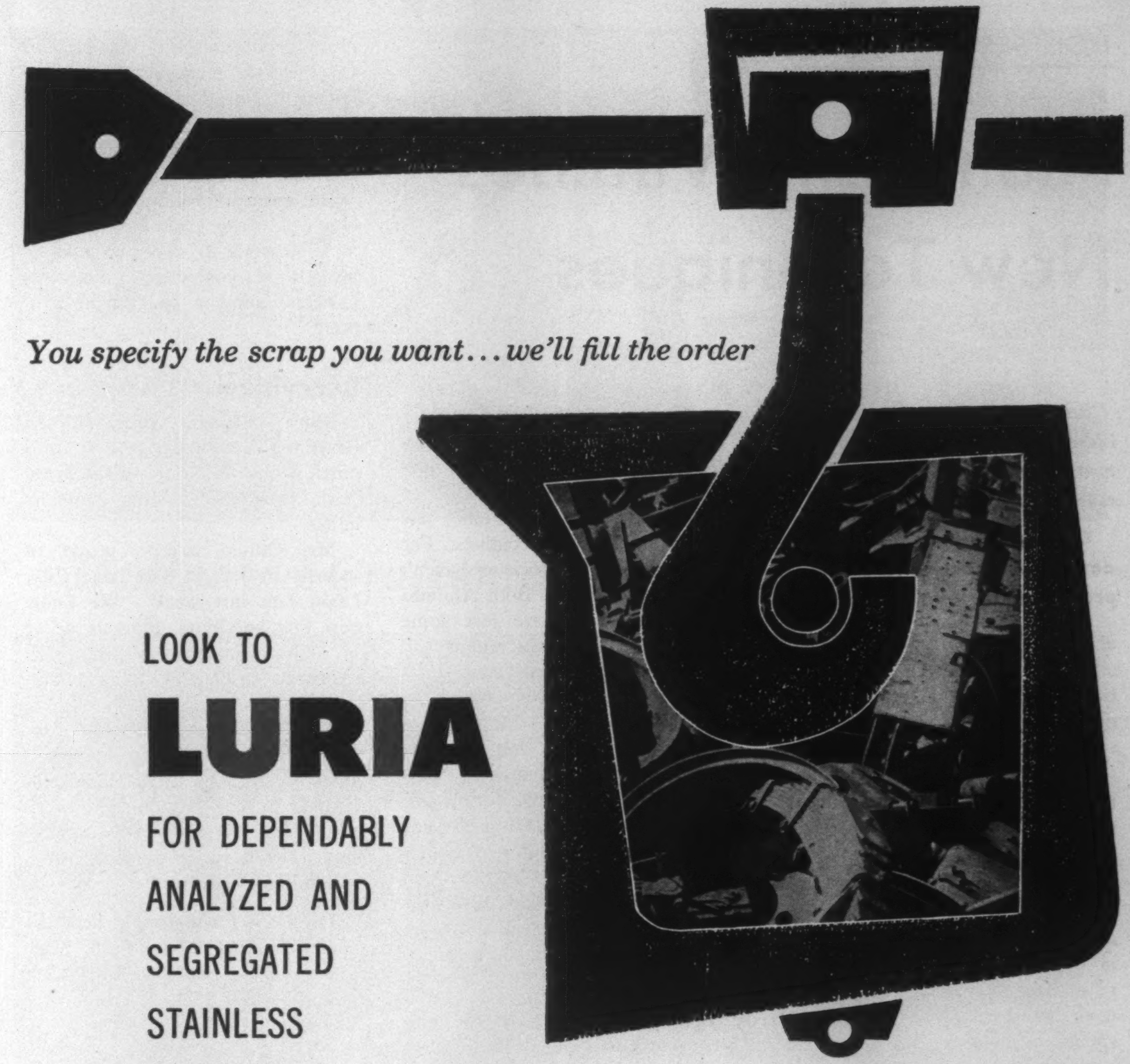
Brokers buying prices per net ton on cars:

No. 1 hvy. melting	....	$25.80
No. 2 hvy. melting cut 3 ft. and under	....	22.50
No. 1 dealer bundles	....	25.80
No. 2 bundles	....	19.00
Mixed steel scrap	....	16.00
Bush., new fact., prep'd.	....	25.50
Bush., new fact., unprep'd	....	20.45
Machine shop turn.	....	10.00
Short steel turn.	....	12.00
Mixed bor. and turn.	....	12.00
Cast scrap	....	33.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	....	$34.00
No. 2 hvy. melting	....	31.00
No. 2 bundles	....	18.00
Machine shop turn.	....	12.00
Shoveling turnings	....	14.00
Cut structural plate 2 ft. & under	$40.00 to	41.00
Unstripped motor blocks	26.00 to	27.00
Cupola cast.	33.00 to	34.00
Heavy breakable cast.	25.00 to	26.00



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Aluminum Watches New Techniques

Rumor is going through the industry that two aluminum makers are flirting with a direct method of reduction.

One result may be a slowdown in new capacity until new processes are evaluated.

▪ Several recent moves in the aluminum industry have revealed a broad development that has been going on quietly, but in dead seriousness, for the past 10 years.

Aluminium Ltd., major Canadian producer, is building an 8000-ton pilot plant to make aluminum by a new, more direct method.

French Effort — In Europe, Pechiney, the large French producer, reports it broke ground late in 1959 on a 3000 to 5000-ton pilot plant to make aluminum in a new, short-cut way. This plant should begin producing very soon.

The big advantages of these new, and seemingly related, developments are: (1) much cheaper initial investment; and (2) lower operating costs.

Aluminium's pilot plant will cost about $500 to $600 per ton of installed capacity, just about half the cost of a conventional aluminum facility. While neither Aluminium nor Pechiney will pin-point operating savings, other sources estimate them between 1¢ and 4¢ per lb of produced aluminum.

Others Active — Under the impact of the two announcements, other major producers have admitted they have been working, and spending millions of dollars, in this direction for the last decade.

What will this technological development mean to world aluminum markets?

Very little for some time, say several aluminum executives. For one thing, the new processes haven't been proven out yet. Both Aluminium and Pechiney are just going into pilot plant stages, and it will be at least two or three more years until they can even begin to evaluate the results.

This will likely shut off any major capacity expansions, particularly in the U. S., during this period. The simple fact is no one will put up capital for new aluminum capacity with a breakthrough like this possible. And, until the new techniques are checked out, no one will back them on a major scale.

Impact on Prices?—If the new processes prove out, will it mean lower aluminum prices?

Not right away, say most observers. For many years the huge majority of aluminum will be made in current installations, at about the same cost ratios.

And even if the price is knocked down, it won't change basic trends in the industry, say several aluminum spokesmen.

"Marketing is the key to aluminum expansion," one executive points out. "A lower price, with a profit margin to increase market development work, would certainly be a major factor in aluminum's growth picture."

. . . And on Investment — Will cheaper initial investment bring more producers into the picture? On the long term, probably. And it might mean less government opposition to the tendency of major producers to integrate more toward consumer products.

But more intra-industry competition would sap some of the industry's strength to continue making inroads in competitive material's markets, another spokesman cautions.

Berryllium

Bruce Odlum, president of Beryllium Resources, Inc., is optimistic about the future of the metal made from the ore his company mines.

Mr. Odlum told a group of security dealers in Salt Lake City, Utah, late last week: "We know now that beryllium minerals occur in sufficient quantity to allow the industry to expand to a major industry."

And Mr. Odlum went on, "Continuous growth of the beryllium industry is clearly indicated. Growth to date has doubled every other year. Today's $40 million industry will surely be tomorrow's $80 million industry."

Tin prices for the week: Sept. 21—102.25; Sept. 22—102.25; Sept. 23 — 102.25; Sept. 26 — 102.25; Sept. 27—102.25.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	33.00	30–33	11/12/59
Copper (CS)	33.00	35.00	3/11/60
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.80	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium Ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	150–160	162–182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 176.

Dedicated Craftsmanship is Foremost...

at Bristol Brass... Many innovations have occurred since the 18th century when deft artisans with simple tools "custom-tailored" brass with outstanding precision. On this ever-changing scene, however, are certain types of operations which require the skill, the patience, the integrity of the 18th century artisan.

Brass from Bristol combines the careful craft of the 18th century artisan with the 1960 facilities and production skills of mill wisemen who can tell by touch, sight and smell when brass is at its best. And when it is, it's *Bristol Brass . . .* brass sheet, rod and wire made *Bristol Fashion*. The BRISTOL BRASS Corporation. Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut. Bristol Brass has offices or warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse *and for brass forgings, too . . .* Accurate Brass Corp. (subsidiary of The Bristol Brass Corp.), Bristol, Connecticut.

"BRISTOL FASHION" MEANS BRASS AT ITS BEST

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand, Grade	......	67.9	69.0	77.9	103.1
AZ31B Spec.	......	93.3	96.9	108.7	171.3
Tread Plate	......	70.6	71.7	......	......
Tooling Plate	73.0	......	......	......	......

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)	37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting)	40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	....	48.68	58.78
Munts Metal	53.20	....	48.26	....
Comm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	....	52.21	....
Phos. Bz. 5%	77.44	....	78.10	....

Free Cutting Brass Rod .... 36.

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.	29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be	$65.00
Beryllium copper, per lb conta'd Be	$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading	$70.00
Bismuth, ton lots	$ 2.25
Cadmium, del'd	$ 1.50
Calcium, 99.9% small lots	$ 4.55
Chromium, 99.8% metallic base	$ 1.31
Cobalt, 97-99% (per lb)	$1.50 to $1.57
Germanium, per gm, f.o.b. Miami, Okla., refined	$29.95 to $36.95
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$75 to $85
Lithium, 98%	$9.00 to $12.00
Magnesium sticks, 10,000 lb.	57.00
Mercury, dollars per 76-lb flask f.o.b. New York	$208 to $210
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel	69.60
Palladium, dollars per troy oz.	$24 to $26
Platinum, dollars per troy oz.	$82 to $85
Rhodium	$137 to $140
Silver ingots (¢ per troy oz.)	91.375
Thorium, per kg.	$43.00
Vanadium	$ 3.65
Zirconium sponge	$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot	
No. 115	29.25
No. 120	28.25
No. 123	27.25
80-10-10 ingot	
No. 305	33.75
No. 315	31.50
88-10-2 ingot	
No. 210	42.00
No. 215	38.75
No. 245	34.00
Yellow ingot	
No. 405	23.75
Manganese bronze	
No. 421	28.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	25.25-25.50
0.60 copper max.	25.00-25.25
Piston alloys (No. 132 type)	27.00-28.00
No. 12 alum. (No. 2 grade)	23.75-24.25
108 alloy	24.25-24.75
195 alloy	26.75-27.75
13 alloy (0.60 copper max.)	24.75-25.00
AXS-679 (1 pct zinc)	24.00-25.00

(Effective Sept. 27, 1960)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½%	24.75-25.75
Grade 2—92-95%	23.50-24.50
Grade 3—90-92%	22.50-23.50
Grade 4—85-90%	22.00-23.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25¾	25
Comm. bronze	26½	26
Mang. bronze	20¾	20
Free cutting rod ends	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26½
No. 2 copper wire	24½
Light copper	22¼
*Refinery brass	22½
Copper bearing material	21½

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26½
No. 2 copper wire	24½
Light copper	22¼
No. 1 composition	21¼
No. 1 comp. turnings	20¾
Hvy. yellow brass solids	16¼
Brass pipe	14¾
Radiators	17
Aluminum	
Mixed old cast.	13½—14
Mixed new clips	14½—15½
Mixed turnings, dry	14 —14½

Dealers' Scrap

(Dealers' Buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	23½—24
No. 2 copper wire	21½—22
Light copper	19½—20
Auto radiators (unsweated)	13¼—13¾
No. 1 composition	18 —18½
No. 1 composition turnings	16½—17
Cocks and faucets	13¾—14¼
Clean heavy yellow brass	12¾—13¼
Brass pipe	14¼—14¾
New soft brass clippings	14½—15
No. 1 brass rod turnings	13¼—13¾

Aluminum

Alum. pistons and struts	7½— 8
Aluminum crankcase	9½—10
1100 (2s) aluminum clippings	12½—13
Old sheet and utensils	9½—10
Borings and turnings	5½— 6
Industrial castings	10 —10½
2020 (24s) clippings	12½—13

Zinc

New zinc clippings	7 — 7¼
Old zinc	4½— 5
Zinc routings	3¼— 3½
Old die cast scrap	2¾— 3

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	23-23.50
Clean Monel turnings	16.50-17
Old sheet Monel	22-23
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed.	15

Lead

Soft scrap lead	8 — 8¼
Battery plates (dry)	3 — 3¼
Batteries, acid free	2 — 2¼

Miscellaneous

Block tin	79 —80
No. 1 pewter	59 —60
Auto babbitt	43 —44
Mixed common babbitt	10¼—10¾
Solder joints	14½—15
Siphon tops	41
Small foundry type	9¾—10¼
Monotype	9¾—10¼
Lino. and stereotype	8¾— 9
Electrotype	7½— 7¾
Hand picked type shells	5¼— 5¾
Lino. and stereo. dross	2¼— 2¾
Electro dross	2¼— 2¾

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Castle, Pa.									7.425* *M10*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1; C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective Sept. 26, 1960)

IRON AGE

STEEL PRICES

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		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Holloware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3*,				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets.

(Effective Sept. 26, 1960)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

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		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5 675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10*,	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Sept. 26, 1960) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alan Wood Steel Co., Conshohocken, Pa.
A3	Allegheny Ludlum Steel Corp., Pittsburgh
A4	American Cladmetals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angel Nail & Chaplet Co., Cleveland
A7	Armco Steel Corp., Middletown, Ohio
A8	Atlantic Steel Co., Atlanta, Ga.
A9	Acme-Newport Steel Co., Newport, Ky.
A10	Alaska Steel Mills, Inc., Seattle, Wash.
B1	Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2	Bethlehem Steel Co., Pacific Coast Div.
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Bliss & Laughlin, Inc., Harvey, Ill.
B6	Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7	A. M. Byers, Pittsburgh
B8	Braeburn Alloy Steel Corp., Braeburn, Pa.
C1	Calstrip Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C4	Claymont Products Dept., Claymont, Del.
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia Geneva Steel Div., San Francisco
C8	Columbia Steel & Shafting Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Pittsburgh, Pa.
C11	Crucible Steel Co. of America, Pittsburgh
C13	Cuyahoga Steel & Wire Co., Cleveland
C14	Compressed Steel Shafting Co., Readville, Mass.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Connors Steel Div., Birmingham
C18	Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1	Detroit Steel Corp., Detroit
D2	Driver, Wilbur B., Co., Newark, N. J.
D3	Driver Harris Co., Harrison, N. J.
D4	Dickson Weatherproof Nail Co., Evanston, Ill.
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire-Reeves Steel Corp., Mansfield, O.
E3	Enamel Products & Plating Co., McKeesport, Pa.
F1	Firth Sterling, Inc., McKeesport, Pa.
F2	Fitzsimons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.
G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
G4	Greer Steel Co., Dover, O.
G5	Green River Steel Corp., Owenboro, Ky.
H1	Hanna Furnace Corp., Detroit
I2	Ingersoll Steel Div., New Castle, Ind.
I3	Inland Steel Co., Chicago, Ill.
I4	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jessop Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Calif.
K2	Keystone Steel & Wire Co., Peoria
K4	Keystone Drawn Steel Co., Spring City, Pa.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Mercer Tube & Mfg. Co., Sharon, Pa.
M4	Mid States Steel & Wire Co., Crawfordsville, Ind.
M7	Milton Steel Products Div., Milton, Pa.
M8	Mill Strip Products Co., Evanston, Ill.
M9	Moltrup Steel Products Co., Beaver Falls, Pa.
M10	Mill Strip Products Co., of Pa., New Castle, Pa.
N1	National Supply Co., Pittsburgh
N2	National Tube Div., Pittsburgh
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N6	Northwest Steel Rolling Mills, Seattle
N7	Newman Crosby Steel Co., Pawtucket, R. I.
N8	Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9	Nelson Steel & Wire Co.
O1	Oliver Iron & Steel Co., Pittsburgh
O2	Oregon Steel Mills, Portland
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Steel Corp., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Portsmouth Div., Detroit Steel Corp., Detroit
P8	Plymouth Steel Co., Detroit
P9	Pacific States Steel Co., Niles, Cal.
P10	Precision Drawn Steel Co., Camden, N. J.
P11	Production Steel Strip Corp., Detroit
P13	Phoenix Mfg. Co., Joliet, Ill.
P14	Pacific Tube Co.
P15	Philadelphia Steel and Wire Corp.
R1	Reeves Steel & Mfg. Div., Dover, O.
R2	Reliance Div., Eaton Mfg. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roebling Sons Co., John A., Trenton, N. J.
R5	Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Rome Strip Steel Co., Rome, N. Y.
S1	Sharon Steel Corp., Sharon Pa.
S2	Sheffield Steel Div., Kansas City
S3	Shenango Furnace Co., Pittsburgh
S4	Simonds Saw and Steel Co., Fitchburg, Mass.
S5	Sweet's Steel Co., Williamsport, Pa.
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monaca, Pa.
S9	Superior Steel Div. of Copperweld Steel Co.
S10	Seneca Steel Service, Buffalo
S11	Southern Electric Steel Co., Birmingham
S12	Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13	Seymour Mfg. Co., Seymour, Conn.
S14	Screw and Bolt Corp. of America, Pittsburgh, Pa.
T1	Tonawanda Iron Div., N. Tonawanda, N. Y.
T2	Tennessee Coal & Iron Div., Fairfield
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Strip Div., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T7	Texas Steel Co., Fort Worth
T8	Thompson Wire Co., Boston
U1	United States Steel Corp., Pittsburgh
U2	Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3	Ulbrich Stainless Steels, Wallingford, Conn.
U4	U. S. Pipe & Foundry Co., Birmingham
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheatland Tube Co., Wheatland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Div., Buffalo
W7	Wilson Steel & Wire Co., Chicago.
W8	Wisconsin Steel Div., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wyckoff Steel Co., Pittsburgh
W12	Wallace Barnes Steel Div., Bristol, Conn.
Y1	Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities		Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	City Delivery‡ Charge	Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	....	....	....	....
Baltimore**	$.10	8.37	9.71	10.16	10.78	8.94	9.63	9.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	....	....	....
Boston**	.10	9.77	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	8.80	9.95	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.70	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.02	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72[1]	10.13	11.39	11.01	8.80	9.45	8.81	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	....	....	....	20.84
Detroit**	.15	8.98	10.61	10.65	11.26	8.93	9.62	9.01	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	10.03	12.19[3]	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.36	11.02	11.50	11.02	9.25	9.95	9.46	11.72	17.17	15.87	21.87	21.12
Los Angeles**		9.59[1]	11.29	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.99	10.20	....	11.39	10.27	10.48	10.07	12.89	....	....	....	....
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	8.84	11.04	17.24	16.24	21.24	20.49
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	....	....	8.90	8.65	9.20	8.90	10.70	....	....	....	....
Philadelphia**	.10	8.95	10.10	10.76	10.95	9.30	9.95	9.35	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	8.70	11.40	17.10	16.10	19.70	20.45
Portland**		10.20	12.05	12.35	12.20	10.35	10.80	10.20	16.65	18.50	17.45	20.75	20.25
San Francisco**	.10	10.27	11.79[2]	11.55	11.88	10.48	10.59	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.75	10.68	11.09	8.77	9.29	8.92	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.74	10.99	11.16	8.83	9.33	8.97	11.64	....	16.69	....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Sept. 26, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*..	62.00	62.50*	66.50	....	....
Birmingham *W9*..	62.00	62.50*	66.50	....	....
Birmingham *U4*..	62.00	62.50*	66.50	....	....
Buffalo *R3*.......	66.00	66.50	67.00	67.50	....
Buffalo *H1*.......	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*.......	66.00	66.50	67.00	67.50	....
Chester *P2*.......	68.00	68.50	69.00	....	....
Chicago *I4*.......	66.00	66.50	66.50	67.00	....
Cleveland *A5*....	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*....	66.00	66.50	66.50	67.00	....
Duluth *I4*........	66.00	66.50	66.50	67.00	71.00†
Erie *I4*..........	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*......	75.00	75.50	....	....	....
Geneva, Utah *C7*.	66.00	66.50	....	....	....
Granite City *G2*..	67.90	68.40	68.90	....	....
Hubbard *Y1*......	....	....	66.50	....	....
Ironton, Utah *C7*.	66.00	66.50	....	....	....
Lyles, Tenn. *T3*..	....	....	....	....	73.00
Midland *C11*......	66.00	....	....	....	....
Minnequa *C6*....	68.00	68.50	69.00	....	....
Monessen *P6*....	66.00	....	....	....	....
Neville Is. *P4*....	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	....	66.50	67.00	67.50	....
Rockwood *T3*....	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*...	66.00	....	66.50	67.00	....
So. Chicago *R3*...	66.00	66.50	66.50	67.00	....
Sc. Chicago *W8*..	66.00	....	66.50	67.00	....
Swedeland *A2*...	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*........	66-00	66.50	66.50	67.00	....
Troy, N. Y. *R3*...	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*..	....	....	66.50	....	....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31–0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, (Globe Div.), $78.00; Niagara Falls (15.01–15.50), $101.00; Keokuk (14.01–14.50), $89.00; (15.51–16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)	
Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Discount Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	--	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	43.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown. *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7*, Wallingford. Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8*; Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* wensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa , *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Discount Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium..					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Sept. 26, 1960)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3****..	173	190	...	...	190	9.00	9.675
Atlanta *A8***....	173	191	...	212	197	9.00	9.75
Bartonville *K2***.	175	193	183	214	199	9.10	9.85
Buffalo *W6*......	...	...	...	...	...	9.00	9.55*
Chicago *N4*.....	173	191	177	212	197	9.00	9.75
Chicago *R3*.....	...	...	...	...	...	9.00	9.55
Cleveland *A6*...	...	...	...	...	...	...	...
Cleveland *A5*...	...	...	...	...	...	9.00	...
Crawf'dsv. *M4***	175	193	...	214	199	9.10	9.85
Donora, Pa. *A5*..	173	187	...	212	193	9.00	9.55
Duluth *A5*......	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*...	9.10‡	...	...	...	...	...	...
Houston *S2*.....	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*.	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***.	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*....	173	187	...	212	193	9.00	9.55
Kokomo *C9**....	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	...	...	...	...	...	9.95	10.625
Kansas City *S2**.	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*....	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	...	...	...	...	...	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*..	173	187	...	...	193	9.00	9.55
So. Chicago *R3*..	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*..	...	...	...	236	...	9.95	10.50
Sparrows Pt. *B3***	175	...	...	215	198	9.10	9.775
Struthers, O. *Y1**	...	...	...	...	...	8.65	9.20
Worcester *A5*...	179	...	...	...	...	9.30	9.85
Williamsport *S5*..	...	...	...	...	...	...	...

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50	......	......	......	......	......	......	......	......
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50	......	......	......	......	......	......	......	......
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Fontana *K1*	+6.25	......	+2.25	......	0.75	......	1.25	......	1.75	......	2.25	......	2.75	......	......	......	......	......	......	......	......	......
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50	......	......	......	......	......	......	......	......
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13 00¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	139.8
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

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FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	32.75
0.05% C....	33.50	1.00% C....	32.50
0.10% C....	33.25	1.50% C....	32.25
0.20% C....	33.00	2.00% C....	32.00

4.00-4.50% C, 60-70% Cr, 1.2% Si..	28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si	28.25
0.25% C (Simplex)	31.50
5-7% C, 61-65% Cr, 5-8% Si	22.00
5% max C, 50-55% Cr, 2% max Si..	25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C	$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	24.50	14.60
Ton lots	29.75	16.05
Less ton lots	31.35	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload bulk	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 75 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.70
Ton lots packed in bags	16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

	Palmerton, Pa.		Neville Is., Pa.
Mn	10 lb, pig	35 lb, down	35 lb
16-19% ..	$98.00	$96.00	$100.50
19-21% ..	100.00	98.00	102.50
21-23% ..	102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads, bulk	34.25
Ton lots, palletized	36.25
250 to 1999 lb	39.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads (Bulk)	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.

Carloads bulk	11.60
Ton lots, packed	13.25
Carloads, bulk, delivered, per lb of briquet	14.00
Briquets, packed pallets, 2000 lb up to carloads	16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe ..	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
		90% Si....	20.00

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb...	2.40	3.30	4.55

(Effective Sept. 26, 1960)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.	
Carloads, bulk	9.85¢
Ton lots	11.20¢
Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo	$1.50
Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound	
Ton lots	$3.45
Less ton lots	3.50
Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta	$3.40
Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo..	$1.76
Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton	$120.00
10 tons to less carload	$131.00
Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti	$1.35
Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti	$1.50
Less ton lots	$1.54
Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$255.00
Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered	$2.15 (nominal)
Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth, Pa.	$1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.38
Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.	
Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢
Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5	$1.38
Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk..	26.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	
2000 lb carload	$5.50
Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound	30¢
Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.	
Ton lots per pound	18.25¢
Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots...	$1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up	
10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50
Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over	
No. 1	$1.05
No. 79	50¢
Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	
Ton lots (packed)	$1.46
Less ton lots (packed)	1.57
Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots	2.15

THE CLEARING HOUSE

Cleveland Company Lands Sales

Used machine dealers in most parts of the country are finding sales down. However, a Cleveland company has a different tale.

The purchase of a large Texas plant and equipment resulted in a ready market.

- While most used machine dealers are struggling to find sales, one Cleveland company has met the problem with success. Early this year, Noll Equipment Co., purchased a 200,000 sq ft oil field equipment plant in Texas for liquidation. It included about $1 million worth of machine tools. At an intensive sale in March, about half the tools and the metal building itself were sold.

It was disassembled and shipped to another part of Texas. Remainder of the tools, including several desirable pieces, are still being sold.

Large equipment, for which an almost immediate market was found, included big radial drills, engine lathes, surface grinders and boring mills, according to Leo Corrigan, Noll Equipment's machine tool equipment manager.

A Choice Item—Choicest piece of equipment still remaining for sale is a table type horizontal boring mill available for less than half of its replacement cost. This machine has a 6 ft by 12 ft table and a 6 in. dia. spindle. It will drill, ream, tape and bore.

European and South American forging companies are expanding to keep up with their market.

To Italy—One $375,000 forging machine went to Italy and included installation and operator training. Among U. S. and European builders, lead times for this class of equipment is from 6 months to 1 year because of an abnormally big backlog plus huge castings, weldments and generally massive construction.

ALMOST FULL: The Cleveland warehouse of Noll Equipment Co. is nearly full of used machine tools. The tools were worth $4 million new.

VARIABLE VOLTAGE DRIVES
3 PHASE 60 CYCLE
Quan. Size Description
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1—1500 HP DC MOTOR 600 V. 600 RPM Whse. M. G. Set. 1500 K.W. G.E. 13,200 V.
1—1500 HP DC MOTOR 600 V. 300/700 RPM Whse. M.G. Set—1500 K.W. G.E. 13,200 V.
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1, BALDWIN, 120-Ton, 1000 H.P., Std. Ga.
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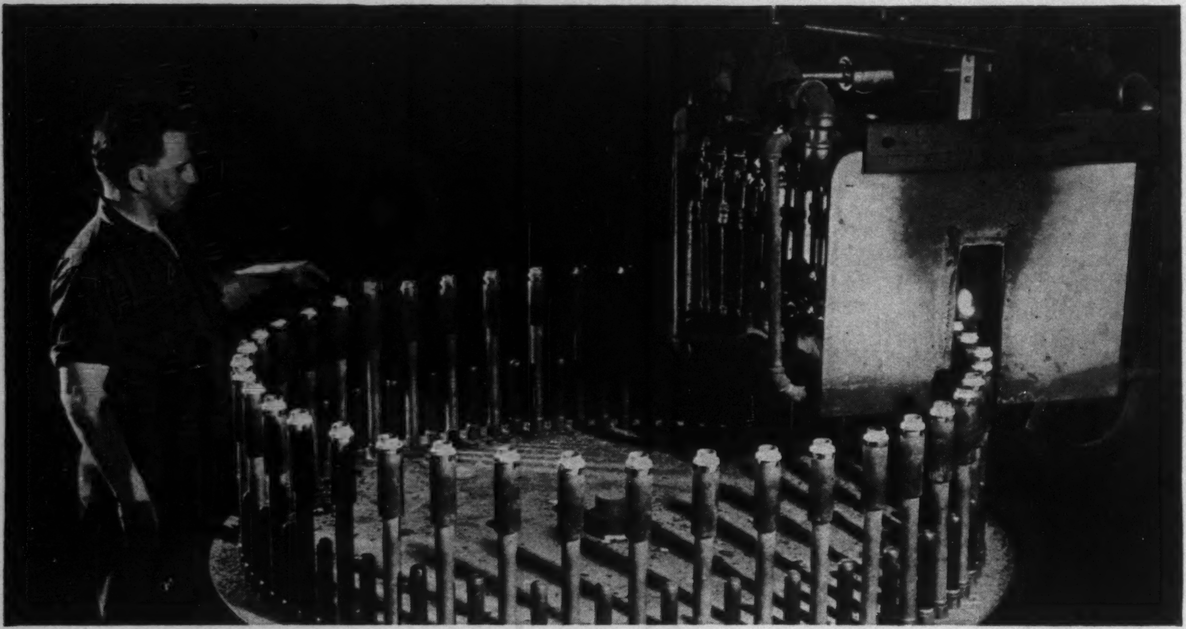
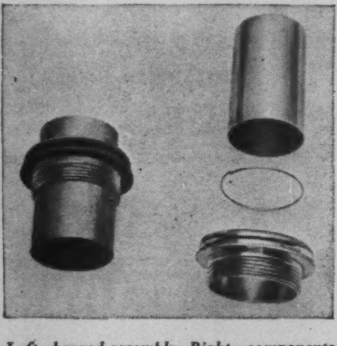


Rotating jig showing mounted assemblies entering and leaving gas-air furnace.



Left— brazed assembly. Right— components with preform ring of EASY-FLO *45.*

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